# CONFERENCE SOUVENIR

## INTERNATIONAL CONFERENCE ON INTEGRATING RECENT INNOVATIONS IN SCIENCE AND TECHNOLOGY: SHAPING THE FUTURE (ICIRIST – 2024)

IN ASSOCIATION WITH


Editors

Dr. D. Shanmugasundaram, Dr. T. Sivaraman,
Dr. S. Anbu, Dr. K. Velmurugan & Dr. K. Anbarasan



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**Conference Souvenir**

# International Conference on Integrating Recent Innovations in Science and Technology: Shaping the Future (ICIRIST 2024)

**In association with**

## Editors


**Dr. D. Shanmugasundaram**
*Principal*

**Dr. T. Sivaraman**
*Dean – Research*

**Dr. S. Anbu**
*Associate Professor*

**Dr. K. Velmurugan**
*Control of Examinations*

**Dr. K. Anbarasan**
*Dean - Academic*


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# SHRI. A. SRINIVASAN
# CHANCELLOR
# DHANALAKSHMI SRINIVASAN UNIVERSITY

## Message

I am delighted to know that the Research & Development Cell of Dhanalakshmi Srinivasan Engineering College is hosting the "International Conference on Integrating Recent Innovations in Science and Technology: Shaping the Future" (ICIRIST-2024). The event is scheduled to take place from February 1 to 3, 2024, at Dhanalakshmi Srinivasan University in Perambalur, Tamil Nadu.

The constant emergence of innovative inventions in Science, Engineering, and Technology is a promising trend. The decision to organize an international conference on "Recent Innovations in Science and Technology" is commendable. The primary objective of these conferences is to provide a substantial platform for intellectual exchange. Researchers, industrialists, and students can come together to share their findings and insights in the realm of 'Innovative Researches', contributing to the enhancement of human life on both global and local scales.

It is anticipated that the conference will serve as a catalyst for fostering a deeper understanding of various recent innovations from a broader perspective. I extend my best wishes to the organizing committee of ICIRIST-2024, hoping for the success of the event. May the academic deliberation sessions with esteemed scientists be fruitful and contribute significantly to the advancement of knowledge.

**Dr. Jerry Poh Kiat Ng**
**Dean, Faculty of Engineering & Technology**
**Multimedia University Malaysia**

## Message

It brings me great joy to learn that the Dhanalakshmi Srinivasan Engineering College, Perambalur, Tamil Nadu, India is hosting the "International Conference on Integrating Recent Innovations in Science and Technology: Shaping the Future (ICIRIST-2024)" from February 1 to 3, 2024, at the premises of Dhanalakshmi Srinivasan University, Perambalur. Additionally, the conference includes the release of a souvenir/proceedings to commemorate this significant scientific event. I am confident that the proceedings will yield valuable insights and suggestions for advancing research and applications in the innovative research.

On this auspicious occasion, I extend my warmest greetings to the Conveners and Organizing Secretaries and all the participants of the ICIRIST-2024. I wish them every success in their future endeavors. May the international conference be a resounding success, contributing to the growth and development of knowledge in the fields of Science, Engineering and Technology. I wish the international conference a grand success.

**Dr. K. Elangovan**
**Additional Registrar**
**Dhanalakshmi Srinivasan University**
**Perambalur**

## Message

I am pleased to discover that the Research and Development Cell of Dhanalakshmi Srinivasan Engineering College, Perambalur, is hosting the "International Conference on Integrating Recent Innovations in Science and Technology: Shaping the Future" (ICIRIST-2024) from February 1 to 3, 2024, at the Dhanalakshmi Srinivasan University premises, Perambalur. I am also delighted to learn that a conference proceeding will be published to commemorate this occasion. Focusing on the cutting-edge innovative research in Science, Engineering and Technology, this conference promises to significantly contribute to the updating of knowledge and understanding in the research of recent trends.

On this noteworthy occasion, I extend my heartfelt greetings to the Organizing Committee and all the participants of the ICIRIST-2024. I wish them every success in their future endeavors. May the international conference be characterized by productivity and success, fostering valuable insights and advancements in the field of innovative research.

**Dr. D. Shanmugasundaram**
**Principal**
**Dhanalakshmi Srinivasan Engineering College (Autonomous)**
**Perambalur - 621212**

## Message

I am thrilled to learn that the Research and Development Cell of Dhanalakshmi Srinivasan Engineering College, Perambalur, is orchestrating the "International Conference on Integrating Recent Innovations in Science and Technology: Shaping the Future" (ICIRIST-2024). This momentous event is scheduled to take place from February 1 to 3, 2024, within the esteemed premises of the Dhanalakshmi Srinivasan University, Perambalur. Additionally, there will be the release of a souvenir and conference proceedings as well, marking this scientific gathering as a significant milestone. The conference proceedings are anticipated to offer valuable insights and perspectives, fostering suggestions for further research and applications in the dynamic fields of innovations in Science, Engineering, and Technology. This holds particular relevance to our region.

In light of this auspicious occasion, I extend my warmest greetings to the dedicated Conveners and Organizing Secretaries of the ICIRIST-2024 and all the esteemed participants of the conference. May this gathering serve as a catalyst for intellectual exchange and collaboration, propelling advancements in research and applications. I convey my sincere wishes for the success of the conference and extend my hopes for a future filled with accomplishments for everyone involved. May the ICIRIST-2024 be an outstanding and grand success.

**Dr. T. Sivaraman**
**Dean – Research**
**Dhanalakshmi Srinivasan Engineering College (Autonomous)**
**Perambalur - 621212**

## Message

As a representative of the organizing committee for the "International Conference on Integrating Recent Innovations in Science and Technology: Shaping the Future" (ICIRIST-2024), I take great pride in extending a warm welcome to all the participants hailing from distinguished institutions across India and abroad, including countries such as Ethiopia, South Korea, and Malaysia.

The Dhanalakshmi Srinivasan Engineering College (DSEC) was established by Dhanalakshmi Srinivasan Charitable and Educational Trust in 2001 at Perambalur, Tamil Nadu, and became autonomous in 2020. The Trust started the DSEC with the motto of promoting engineering and technical education to students in rural areas of the backward district of Tamil Nadu. The DSEC has 22 years of enchanting education, and the DSEC is recognized by TCS, accredited with 'A' grade by the NAAC for two consecutive cycles (2013 & 2018), and the departments of BME, ECE, and EEE of the institution are accredited by the NBA for two consecutive cycles (2018 & 2022). Right now, the DSEC offers 16 UG Programmes and 6 PG Programmes and also promotes a research culture at all three higher educational levels. The DSEC provides state-of-the-art infrastructure facilities to students in terms of a lush green campus with a 24-hour Wi-Fi facility, smart classrooms, well-equipped laboratories, a computer-enabled library, a specialized air-conditioned auditorium, and hostel facilities (for both boys and girls) with multi-cuisine food. Highly competent faculty with industry and academic experience caters to the needs of students on the curriculum, and project-based learning is incorporated to equip students with research skills.

The "Research and Development Cell' (RDC) is an integral part of the DSEC and is committed to creating a strong and vibrant higher education system emphasizing active research, innovation, and technology development. The RDC strives to promote research activities to meet the societal challenges of our country as well as pressing technological issues at the global level. To attain the objectives, the RDC of the DSEC plays a crucial role in many

facets: in disseminating research findings to students and faculties of the DSEC through various scientific events as well as through reputed scientific publications; in securing funding for researchers as fellowships, sponsorships, and grants for research projects; in identifying and protecting intellectual property (IP) generated through research activities.

The Research and Development Cell joins hands with Engineering and Technology Departments (Aeronautical, AIDS, Agricultural, Biotechnology, Biomedical, Chemical, Civil, CSE, ECE, EEE, Food, IT, Mechanical, Pharmaceutical & Robotics) and as well Management Studies of the DSEC and organizes this 'International Conference on Integrating Recent Innovations in Science and Technology: Shaping the Future' (ICIRIST-2024). The gist of the international conference is to set up a platform to disseminate unprecedented and unique ways to address complex scientific problems in a more comprehensive manner by integrating the advancements and innovations of science, engineering, technology and paramedical disciplines. In this context, the international conference is meant for researchers who are actively engaged in Interdisciplinary, Multidisciplinary and Transdisciplinary research activities.

We are confident that the conference will effectively raise awareness about the latest and thrilling innovations in Science, Engineering, and Technology. We extend our best wishes to all participants for a fruitful and enriching experience during their time at the conference, ICIRIST-2024.

# International Conference on Integrating Recent Innovations in Science and Technology: Shaping the Future (ICIRIST – 2024)

## Programme Schedule

| DAY 1: FEBRUARY 1, 2024 | |
|---|---|
| 9.30 AM – 10. 30 AM<br>(Central Auditorium) | Inauguration Function |
| 10.30 AM– 10.45 AM | Hi-Tea Break |
| Keynote Lecture - I | |
| 10.45 AM – 11. 45 AM<br>(Central Auditorium) | Trailblazing with TRIZ for Future Excellence<br>Dr. Jerry Poh Kiat Ng<br>Dean - Faculty of Engineering & Technology<br>Multimedia University Malaysia |
| Keynote Lecture - II | |
| 11.45 AM – 12.45 PM<br>(Central Auditorium) | Banknotes Counterfeit Detection Using Image Processing Techniques<br>Dr. Wong Wai Kit<br>Associate Professor, Faculty of Engineering and Technology<br>Multimedia University, Melaka, Malaysia |
| 12.45 PM – 1.45 PM | Lunch |
| Parallel Sessions: Keynote Lectures & Oral Presentations - I | |
| Keynote Lecture - III | |
| 1.45 PM – 2.45 PM<br>(Pharmacy Block) | Effect of single and hybrid reinforcements on mechanical properties of magnesium matrix composites and AZ61 Mg for hydrogen storage applications<br>Dr. Song - Jeng Huang<br>Professor, Department of Mechanical Engineering<br>National Taiwan University of Science and Technology, Taiwan |
| Keynote Lecture - IV | |
| 1.45 PM – 2.45 PM<br>(Pharmacy Block) | Bioinformatics Approaches for Understanding Mutational Effects on Protein Structure and Function: Implications to Diseases |

| | |
|---|---|
| | Dr. Michael Gromiha<br>Professor, Department of Biotechnology<br>Indian Institute of Technology, Madras, India. |
| 1.45 PM – 5.00 PM<br>(Pharmacy Block) | Research Papers & Research Projects Presentations - I |

| DAY 2: FEBRUARY 2, 2024 | |
|---|---|
| Keynote Lecture - V | |
| 9.30 AM – 10. 30 AM<br>(Pharmacy Block) | Current Trend, Challenges and Future Prospects of 3D Technolology For Perovskite Solar Cell Fabrication<br>Dr. Abraham Debebe<br>Vice – President Research and Technology Transfer<br>Addis Ababa Science and Technology University, Addis Ababa, Ethiopia |
| 10.30 AM– 10.45 AM | Hi-Tea Break |
| Keynote Lecture – VI | |
| 10.45 AM– 11.45 AM<br>(Pharmacy Block) | Sustainable Practices to Retrieve Climate Resilience<br>Dr. V. M. Jaganathan<br>Professor, Department of Energy and Environment<br>NIT, Tiruchirappalli, India. |
| Keynote Lecture - VII | |
| 11.45 AM– 12.45 PM<br>(Pharmacy Block) | Designing Interpretable Fuzzy Systems<br>Dr. Praveen Kumar Shukla<br>School of Engineering,<br>Babu Banarasi Das University, Lucknow, India. |
| 12.45 PM – 1.45 PM | Lunch |
| Parallel Sessions: Keynote Lectures & Oral Presentations - II | |
| Keynote Lecture - VIII | |
| 1.45 PM – 2.45 PM<br>(Pharmacy Block) | Unveiling a Promising Chemopreventive Compound and Innovations in Peptidodynmimetic Methodology for Modulating Protein Interfaces<br>Dr. T. Sivaraman<br>Dean – Research, Dhanalakshmi Srinivasan Engineering College,<br>Perambalur – 621212, Tamil Nadu, India. |

| | |
|---|---|
| 1.45 PM – 5.00 PM<br>(Pharmacy Block) | Research Papers & Research Projects Presentations - II |

| DAY 3: FEBRUARY 3, 2023 | |
|---|---|
| Keynote Lecture - IX | |
| 9.30 AM – 10. 30 AM<br>(Pharmacy Block) | Innovations in Engineering a Perspective<br>Dr. M. R. Bhat<br>Professor, Department of Aeronautical Engineering<br>Indian Institute of Science, Bangalore, India. |
| 10.30 AM– 10.45 AM | Hi-Tea Break |
| Keynote Lecture - X | |
| 10.45 AM– 11.45 AM<br>(Pharmacy Block) | Heat transfer and pressure drop studies of $TiO_2$/DI water nanofluids in helically corrugated tubes using spiraled rod inserts<br>Dr. S. Anbu<br>Associate Professor, Department of Mechanical Engineering<br>Dhanalakshmi Srinivasan Engineering College, Perambalur, Tamil Nadu, India. |
| Poster Presentations | |
| 11.45 AM– 12.45 PM | Poster Presentations - I |
| 12.45 PM – 1.45 PM | Lunch |
| 1.45 PM – 2.45 PM | Poster Presentations - II |
| 3.00 PM – 4.00 PM<br>(Pharmacy Block) | Valedictory Function |

# CONTENTS

# KEYNOTE LECTURES

## Keynote Lecture – I

# Trailblazing with TRIZ for Future Excellence

**Ir Ts Poh Kiat Ng**
*Multimedia University, Jalan Ayer Keroh Lama, Melaka, Malaysia*
*E-mail: pkng@mmu.edu.my*

**ABSTRACT**

In this keynote address, I will delve into the transformative realm of TRIZ, an acronym for "Teoriya Resheniya Izobreatatelskikh Zadatch," which translates to the Theory of Inventive Problem Solving (TIPS). Originating from the pioneering work of Russian engineer and scientist Genrich Altshuller, TRIZ strategies have evolved through the comprehensive analysis of thousands of patents, unveiling patterns and innovations. This presentation will illuminate how TRIZ harnesses creative problem-solving methodologies, emphasizing the evolution of technical systems towards increased ideality by surmounting contradictions with minimal resource introduction.

Examining real-world applications, I will showcase two notable TRIZ projects, employing tools such as engineering contradiction, 40 inventive principles, substance field modeling, and physical contradiction. The outcomes of these endeavors include innovative design solutions for a smart lawnmower and a water-drinking habit cultivation device. For the smart lawnmower, the introduction of a pivot design (leveraging inventive principle #30, flexible shell) enables seamless movement on uneven grassland, eliminating the risk of getting stuck. Likewise, the water-drinking habit cultivation device incorporates the segmentation principle (inventive principle #1), presenting a compartmentalized water bottle with separate sections for water containment and a reward beverage, fostering improved hydration habits in children.

These TRIZ-integrated concepts not only exemplify ingenuity in design but also hold promise in enhancing human performance, operational efficiency, and overall health. The keynote will explore the pivotal role of TRIZ in navigating challenges and propelling innovation across various domains.

**Keywords**

TRIZ, Innovative Design, Ergonomics, Human Factors, Machines, Inventiveness

## Keynote Lecture – II

# Banknotes Counterfeit Detection Using Image Processing Techniques

**Wong Wai Kit**
*Multimedia University, Melaka, Malaysia*
*E-mail: wkwong@mmu.edu.my*

**ABSTRACT**

Visually impaired people are facing difficulty in performing their daily activities, one of them is reading banknotes. Assistive technology like Electronic Banknote Recognizers had been proposed by researchers to aid visually impaired person classify the banknotes' values. However, these Electronic Banknote Recognizers have no counterfeit detection capabilities. If cheaters print out counterfeit banknotes with almost identical color quality from the real banknotes and tested with these electronic banknote recognizers, they are unable to detect the real and the fake banknotes. For this instance, counterfeit banknotes will be treated as real banknote and causing the visually impaired users loss in money, loss in mind and loss in faith of doing business.To overcome these limitations, the objective is high on the agenda of United Nation SDG-10 (Reduced Inequality) to formulate a framework for detecting banknote counterfeiting for visually impaired person based on security features released by national banks in each country. This will help the visually impaired person determine the value and authenticity of the banknotes they are holding. This new and critical invention managed to reduce inequality among the visually good and visually impaired person in handling banknotes for their daily life. This keynote will reveal those common categories of worldwide banknotes' watermarks, suggest mechanisms for extracting banknotes watermarks, and share image processing algorithms that detect counterfeit banknotes. The lecture shall provide useful information in determining community and industry relevant research topics, collaborative research opportunity and career choice.

## Keynote Lecture – III

# Effect of single and hybrid reinforcements on mechanical properties of magnesium matrix composites and AZ61 Mg for hydrogen storage applications

**Song-Jeng Huang, Sathiyalingam Kannaiyan, Matoke Peter Mose, Murugan Subramani, Chao-Ching Chiang**
*National Taiwan University of Science and Technology, Taipei, Taiwan.*

**Addisu Negash Ali**
*Bahir Dar University, Bahir Dar, Ethiopia.*

**Konstantin Borodianskiy**
*Department of Chemical Engineering, Ariel University, Ariel, Israel.*
** Corresponding author: e-mail: sgjghuang@mail.ntust.edu.tw*

## ABSTRACT

The reinforcing of Mg matrix composites can be achieved by using single or hybrid reinforcements. In this work, the effects of single (SiC or $Nb_2O_5$), and hybrid ($Al_2O_3$ and SiC) reinforcing particles on the mechanical and microstructural properties of Mg matrix composites were investigated [1–4]. The composites were fabricated by using stir casting method with a controlled casting environment to prevent the Mg burning and oxidation. The casted samples were subjected to homogenization heat treatment at 400°C for 24hrs to dissolve casting induced secondary phases [3]. The maximum hardness, yield strength (YS), ultimate strength (UTS), and elongation were 61.2±4.6 HV, 127.26 MPa, 250.1 MPa, and 19.3% respectively [4]. Hexagonal closed-packed (hcp) AZ61 magnesium alloy has been studied by x-ray diffraction analysis, particle size analysis, and morphology [5]. The particle size of the powder samples was found to be anisotropic in all milled samples with the exception of as-received sample that was spherical. Peak broadening observed, was attributed to the change in particle size and deformation strain during the milling process. Milling caused changes in both the $Mg_{0.97}Zn_{0.3}$, and $Mg_{17}Al_{12}$ phases. The size of crystallites was observed to decrease from 177Å to 11.3Å. Hydrogen measurements [5] revealed that milling AZ61 magnesium can achieve as high as 5.8wt.% $H_2$.

## Keywords

Magnesium alloy; Magnesium Matrix Composites; Reinforcements; Nanoparticles; Severe Plastic Deformation; Mechanical Properties; Hydrogen Storage; Particle Size; Size of Crystallites.

## Keynote Lecture – IV

# Bioinformatics approaches for understanding mutational effects on protein structure and function: implications to diseases

**M.Michael Gromiha**
*Indian Institute of Technology Madras*
*Chennai 600036, INDIA*
*gromiha@iitm.ac.in*

**ABSTRACT**

The substitution of amino acid residues in a protein alters its structure, stability and function, and may lead to diseases (1,2). We have developed comprehensive databases for understanding protein structure and function (3,4), and annotating disease-causing mutations in globular and membrane proteins using experimental data reported in the literature (5,6). These databases provide a description of mutants, structural and functional features along with visualization, search, display, and download options. We have systematically analyzed the effect of these mutations at protein level on change in stability, binding affinity and disease-causing. Utilizing the information, we have developed computational methods for predicting the change in binding affinity upon mutation in protein-protein, protein-DNA and protein-carbohydrate complexes (7,8). Further, computational tools have been constructed for identifying the potential driver and passenger mutations at a large scale, which could be used for designing experiments (9-11). The salient features of the results will be discussed.

## Keynote Lecture – V

# Sustainable Practices to Retrieve Climate Resilience

**V.M.Jaganathan**
*National Institute of Technology, Trichy, Tamil Nadu.*

**ABSTRACT**

Can we retrieve our ability to predict our climate? Is that a meaningful debate in the present scenario? If yes, what should we do?

Climate change has widespread and profound effects on various aspects of the Earth's natural systems and human societies. While the specific impacts can vary by region, some of the general effects of climate change include, rising temperatures, Changes in Precipitation Patterns, Sea Level Rise, Extreme Weather Events, Melting Ice and Snow, Ocean Acidification, loss of Biodiversity, Agricultural impacts and associated social and economic disruptions. Avenues related to renewable energy, green infrastructure, Sustainable agriculture, water management and biodiversity preservation are crucial to be understood by every modern human in this world. The targets and goals set up by the global climate forums need to speed up the rate of sustainable practices from fast mode to extremely fast mode. Changes related to technical Innovation, policies and governances should be given more emphasis. Changes expected from individual level, community level, country level and global level should be defined in a precise manner. Importance on sustainability and devising financial mechanism should be given special focus to bring out useful decisions to retrieve climate resilience. An attempt to explain the potential solutions to think in this direction will be discussed in this keynote lecture.

## Keynote Lecture – VI

# Current Trend, Challenges and Future Prospects of 3D Printing Technology for Perovskite Solar Cell Fabrication

**Bonsa Regassa Hunde, Abraham Debebe Woldeyohannes**
*Addis Ababa Science and Technology University, Sustainable Energy Center of Excellence, Mechanical Engineering Department,Addis Ababa, Ethiopia*

**ABSTRACT**

Since their inception, perovskite solar cells (PSCs) have become an appealing option for solar cell materials. Nevertheless, upscaling, module design, power conversion efficiency (PCE), and stability continued to be obstacles to their progress in spite of their exceptional opto-electronic properties. From a manufacturing perspective, the solution processability of PSCs has paved the way for 3D printing technology. Since its commercialization in 1986, 3D printing technology, an additive manufacturing (AM), has advanced significantly as a viable candidate for producing perovskite solar cells. In the solar cell industry, 3D printing technology can prototype quickly, cut production costs largely, increase efficiency, and utilize a wide variety of substrates. Because of its exceptional capacity to print intricate shapes and create precise systems, 3D printing technology is believed to produce uniformly thin layers of perovskite solar cells. The main aim of this research is to point out the use of 3D printing technology as an alternative in perovskite solar cell fabrication. The research highlights the current trend, challenges, and future prospects of 3D printing technology in solar cell development. The study might lead to more research and investigations into 3D printing technology applications in the solar cell industry.

## Keynote Lecture – VII

# Designing Interpretable Fuzzy Systems

**Praveen Kumar Shukla**
*School of Engineering, Babu Banarasi Das University, Lucknow, India.*

**ABSTRACT**

Fuzzy systems play a crucial role in handling imprecision and uncertainty when modeling real-world systems. This talk aims to delve into the fundamental aspects of fuzzy logic, shedding light on both theoretical concepts and practical applications. Through a comprehensive exploration, various fuzzy models will be elucidated, showcasing their theoretical underpinnings as well as their practical implementations. The discussion will extend to the performance evaluation of fuzzy systems, examining their interpretability and accuracy. Moreover, a detailed examination of the research aspects pertaining to fuzzy systems will be presented, providing a thorough understanding of their implications and advancements.

## Keynote Lecture – VIII

# Unveiling a Promising Chemopreventive Compound and Innovations in Peptidodynmimetic Methodology for Modulating Protein Interfaces

**Thirunavukkarasu Sivaraman**
*Dhanalakshmi Srinivasan Engineering College*
*Dhanalakshmi Srinivasan Group of Institutions, Perambalur*
*Tamil Nadu, India*
**Email for correspondence: rdcelldsec@dsengg.ac.in*

**ABSTRACT**

The anti-apoptotic protein Bcl-B (hBcl-B) in Homo sapiens has been identified as a specific interactor with the pro-apoptotic protein hBax, suggesting a pivotal role for hBcl-B in apoptotic processes exclusively mediated by hBax. To minimize potential adverse effects on chemotherapy treatments, especially in cases where cancer cells overproduce hBcl-B compared to other anti-apoptotic proteins, it becomes imperative to design specific inhibitors targeting hBcl-B. In this study, pharmacophore patterns representing essential residues of hBaxBH3 for interaction with hBcl-B were discerned under both static (peptidomimetic method) and dynamic (peptidodynmimetic method) conditions. Utilizing these pharmacophore patterns, screening of hBaxBH3-mimetic compounds was performed using the MMsINC database, containing approximately 17 million conformers of about 4 million diverse molecules. The compounds identified through the dynamic pharmacophore model exhibited superior ligand efficiencies, bioavailability, and pharmacokinetic properties compared to those retrieved using the conventional static pharmacophore model. Computational methods and comprehensive analyses supported the identification of 2-hydroxy-3,5-dinitrobenzamide (HDNB) as a promising prototypic anti-cancer compound. Subsequent evaluation of HDNB's chemopreventive effect on N-nitroso-methylurea-induced Wistar female rats with mammary gland carcinogenesis revealed its ability to reverse abnormalities in various biochemical parameters in both blood samples and breast tissues, bringing values close to those of the healthy control. The presentation will delve into the molecular mechanisms underlying HDNB's chemopreventive potential, and it will also discuss the unique advantages of the peptidodynmimetic method in efficiently identifying chemical ligands to modulate protein-protein/peptide interfaces composed of diverse amino acids.

**Keywords**

Apoptosis, Anti-cancer compounds, Computational Strategies, Drug Design and protein interfaces

## Keynote Lecture – IX

# Innovations in Engineering a Perspective

**M.R.Bhat**
*Chief Research Scientist*
*IISc., Bengaluru, India*

**Abstract**

Engineering and Technology over the decades have evolved depending upon the needs and with advances primarily in defence and medical fields. Design concept has changed from Infinite Life to Definite Life, Fracture Mechanics to Damage Tolerance and so on. Materials have evolved from Stone age to Metals, Plastics, Composites to Smart materials. Quality control has taken different roles from Non-destructive Testing, Evaluation to Diagnostics and Prognostics. Statistical approaches have brought a sea of change in the way we look at engineering and technology. AI, Robotics, Digital Twinning, Unmanned vehicles, ML, 3D printing etc., are the current buzz words in Engineering and Technology. This talk touches upon all these aspects of Engineering and Technology from past to present to immediate future. The downside and negative aspects of the same will also be briefly presented.

## Keynote Lecture – X

# Heat transfer and pressure drop studies of TiO2/DI water nanofluids in helically corrugated tubes using spiraled rod inserts

**S.Anbu**
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**Abstract**

An experimental study on the convective heat transfer and friction factor characteristics of $TiO_2$/DI water nanofluids in uniformly heated plain and helically corrugated tubes (HCT) with and without spiraled rod inserts (SRI) under laminar flow regime is presented in this paper. $TiO_2$ nanoparticles with an average size of 32 nm are dispersed in deionized (DI) water to form stable suspensions containing 0.1, 0.15, 0.2, and 0.25% volume concentrations of nanoparticles. It is found that the inclusion of nanoparticles to DI water ameliorated Nusselt number which increased with nanoparticles concentration upto 0.2%. Two spiraled rod inserts made of copper with different pitches ($p_i$ = 50 mm and 30 mm) are inserted in both plain and corrugated tubes and it is found that the addition of these inserts increased the Nusselt number substantially. For Helically corrugated tube with lower pitch and maximum height of corrugation ($p_c$ = 8 mm, $h_c$ = 1 mm) with 0.2% volume concentration of nanoparticles, a maximum enhancement of 15% in Nusselt number is found without insert and with insert having lower pitch ($p_i$ = 30 mm) the enhancement is 34.01% when compared to DI water in plain tube. The results on friction factor show a maximum penalty of about 53.56 % for the above HCT.

**Keywords**

TiO**2/**DI watenanofluids, Laminarflow, Nusselt number, Corrugated tubes, Thermal performance factor

# Research Paper Presentations – I

**ICIRIST-FLP-ABS-EO1**

# AUTOMATIC SOLAR-POWERED PLANT WATERING SYSTEM FOR HOME GARDENING

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**Abstract**

The article covers the development of an automated solar-powered plant watering system that will help home gardeners who struggle with locating sufficient time to irrigate their plants. The system monitors the surrounding plantation and the state of the soil beneath the plants using DHT11 humidity temperature sensors and soil moisture sensors. Utilising the Arduino IDE programme, the Arduino Uno R3 (Atmega 328p) receives the readings from these sensors to determine the state of the plant. In order to determine if the plant is receiving enough water and to regulate the water pump to irrigate it, the Arduino IDE programme computes the sensor values and determines whether the soil condition is above or below the threshold value. For the automated plant watering system to function, a five-volt solar panel and an MPPT charging controller are required. The DHT11 Sensor and Soil Moisture Sensor recommended ranges are clearly stated and documented in the article.

**Keywords**

Plant Watering, Watering System, Solar Power, Home Gardening, Embedded System.

**ICIRIST-FLP-ABS-EO2**

# Pyridine Derivative Silver Nanoparticles: Synthesis, Characterization and In Vitro Assessment of Antimicrobial activity

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## ABSTRACT

Silver nanoparticles (AgNPs) have found extensive applications in cotton fabrics, cosmetics, food packaging, agricultural products and biomedical applications such as wound dressings, dental materials, bone implants, tissue engineering, drug delivery carrier, coated medical equipment and so forth. These nanoparticles possess unique antimicrobial properties, making them a promising alternative to antibiotics in combating bacterial pathogens. Consequently, this study aimed to synthesize silver nanoparticles conjugated with pyridine derivatives and investigate their characterization and antimicrobial potential. To determine the formation and stability of pyridine-coated silver nanoparticles, UV-vis spectroscopy analysis was conducted. The morphological appearance of these nanoparticles was revealed through SEM analysis, which demonstrated their spherical shape. Additionally, FTIR analysis was employed to observe the functional groups present in the synthesized pyridine-coated silver nanoparticles. The average size of the synthesized nanoparticles was analyzed using DLS measurement. Furthermore, the primary objective of this study was to assess the antimicrobial potential of pyridine-coated silver nanoparticles against both gram-positive and gram-negative bacteria using the disc diffusion method. In summary, this study focused on synthesizing and characterizing silver nanoparticles conjugated with pyridine derivatives. The antimicrobial potential of these nanoparticles was investigated, providing valuable insights into their potential applications in combating bacterial pathogens.

**Keywords**

Pyridine, Silver nanoparticles, Chemical synthesis, Antibacterial activity.

**ICIRIST-FLP-ABS-EO3**

# MACHINE LEARNING BASED HATE SPEECH DETECTION AND CLASSIFICATION IN TWITTER-SOCIAL MEDIA NETWORK

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## ABSTRACT

Twitter and other social media platforms have become entwined in our lives. They give us a place to tell our stories and share our ideas with the world. On the other hand, there are some people who take advantage of these platforms' freedom of expression to spread hateful and derogatory content. This is a significant issue in today's society, and it is difficult to identify such content. Natural language processing methods are used to propose a method for detecting hate speech on social media in this research paper. We utilize an openly accessible dataset given by Crowd Flower and perform text pre-handling to clean the dataset. After that, we use feature engineering to find important features that can be used in classification algorithms for machine learning. Each feature set's performance is compared to that of other algorithms, and the outcomes are thoroughly examined. In the fight against the spread of hate speech, especially on social media, automated hate speech detection is an important tool. For the job, numerous approaches have been developed, the most recent of which is based on deep learning. Additionally, a number of datasets have been created to demonstrate various manifestations of the hate speech detection issue. Through the three most widely used datasets, we present a large-scale empirical comparison of deep and shallow hate speech detection methods. Our objective is to highlight developments in the field and determine the current state of the art's strengths and weaknesses Using Hybrid technique to classify speech such as random forest, decision tree, and Support vector machine.

## Keywords

Hate speech detection, social media, Natural Language Processing, Machine Learning, Artificial Intelligence, Sentiment Analysis

**ICIRIST-FLP-ABS-EO4**

# ANALYSIS OF CORTICOMUSCULAR COHERENCE BETWEEN CORTICAL AND FACIAL MUSCLE ACTIVITIES

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## ABSTRACT

*The most frequent human behavior is emotional, and this is where it is crucial to assess the functional relationship between the motor cortex and the muscles of the face. By comparing the coherence of the concurrently recorded electroencephalography (EEG) and electromyography (EMG) activities, this corticomuscular control is typically identified. The EEG-EMG coherence has been attempted to be estimated in this work utilizing magnitude squared coherence (MSC) functions. The concurrent EEG-EMG activity of 32 healthy volunteers was used for this purpose as they watched films in various emotional states. The magnitude squared coherence function is applied to the facial EMG signal of the zygomaticus major muscle and the EEG signal connected to the motor cortex region. Additionally, the connection between EMG signals and the alpha (8-13 Hz) and beta (14-29 Hz) spectral components of traditional EEG frequency bands is also examined. The findings demonstrate a considerable electrical coherence between the brain and the facial muscles in a range of emotional states. The frequency band interactions are also discovered to differ for various emotional states. The analysis appears to be able to be expanded to include the development of corticomuscular function in patients with neurological disorders.*

## Keywords

EEG, EMG, Corticomuscular Coherence, Magnitude Squared Coherence

**ICIRIST-FLP-ABS-EO5**

# COVID-19 SMART HEALTH MONITORING SYSTEM UTILIZING IOT TECHNOLOGY

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## ABSTRACT

Technology plays a significant role in healthcare, encompassing sensory devices, communication tools, recording devices, and display devices. Monitoring various medical parameters and post-operative progress is crucial, leading to the adoption of the latest trend in communication methods using the Internet of Things (IoT). The IoT acts as a catalyst for healthcare, playing a prominent role in a wide range of healthcare applications. In this particular project, a PIC microcontroller serves as a gateway to communicate with various sensors such as a temperature sensor and pulse oximeter sensor. The microcontroller collects sensor data and transmits it to the network via Wi-Fi, enabling real-time monitoring of healthcare parameters for doctors. The data can be accessed by the doctor at any time. Additionally, the controller is connected to a buzzer to alert the caretaker in case of variations in sensor output. However, a major concern in remote patient monitoring systems is securely transmitting data to the intended destination and allowing access only to authorized users. To address this security issue, the data is transmitted through a password-protected Wi-Fi module, specifically the ESP8266, which encrypts the data. Standard users and doctors can access the data by logging into the HTML webpage. During critical situations, an alert message is sent to the doctor through a GSM module connected to the controller, enabling prompt provisional medication. This system exhibits efficiency with low power consumption, easy setup, high performance, and timely responses.

**ICIRIST-FLP-ABS-EO6**

# INTEGRATED HEALTH ASSESSMENT AND SMART VENTILATIO N CONTROL

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## ABSTRACT

The integration of comprehensive health evaluation and automated ventilation control has emerged as a critical solution in modern healthcare. This system delivers real-time data updates via IoT and LCD interfaces by using temperature monitoring alongside continuous tracking of vital indicators such as heart rate and oxygen saturation levels. Importantly, when abnormalities in heart rate or oxygen saturation levels are identified, an automated servo motor activates the ventilator, giving prompt respiratory support. Concurrently, an audible alarm system notifies all parties involved, including medical staff and concerned family, allowing for fast reaction and care. This ground-breaking solution tackles important issues in hospital environments. Its application transforms patient care by providing a proactive method of ventilation management and health monitoring. Improved patient safety and expedited response mechanisms benefit hospitals, lowering the risks of postponed intervention. Real-time updates and timely warnings can provide families peace of mind and encourage a greater sense of involvement and assurance about the well-being of their loved one. In addition to improving patient outcomes, this technological integration in healthcare also fortifies relationships between medical facilities and the patient support systems.

**ICIRIST-FLP-ABS-EO7**

# BLOCKCHAIN-BASED ANONYMOUS AUTHENTICATION OF CLOUD DATA USING STOCHASTIC DIFFUSION SEARCH ALGORITHM

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## ABSTRACT

Cloud security technology has been crucial in ensuring robust security within the cloud network. The extraction of data from the cloud can potentially include sensitive personal information, making it susceptible to hacking attempts. To safeguard individuals' privacy, various privacy protection technologies have been developed, with anonymity being a prominent one. Traditional anonymous methods are employed to maintain personal privacy. However, ensuring privacy in the cloud presents challenges, particularly in processing incremental data due to constant updates in cloud data. To address this, hierarchical sub-tree formation techniques are utilized to anonymize sub-trees effectively. A hybrid approach leveraging k-anonymity is adopted to achieve efficient sub-tree anonymization and enhance security in the cloud computing environment. The anonymization process involves the introduction of a new Stochastic Diffusion Search algorithm based on k-anonymity. This method facilitates the identification of anonymized users within the cloud blockchain network. The proposed framework aims to develop a hyperledger that enables authenticated user communication within a private network. The Stochastic Diffusion Search algorithm is employed to search for hash codes in the blockchain ledger and user queries in the cloud network. Ultimately, the process yields anonymous data, effectively thwarting hackers' attempts to access personal information about individuals.

**Keywords**

k-anonymity-based Stochastic Diffusion Search algorithm, Blockchain, cloud data.

**ICIRIST-FLP-ABS-EO8**

# AN E-COMMERCE WEB APPLICATION FOR A SMALL RETAIL STORE

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## ABSTRACT

Recently the e-commerce platform isplaying an important role in some areas; its activities are a subset of e-business activities. Theaim of this paper is to build and develop a reliable website based on the e-commerce theories, developing effective well-designed web pages. This website will sell computer products include (hardware and software). For implementthe selling online website, it needs to use currenttechnologies to achieve this goal. As a first stage,it should set up online ecommerce store witheasy-to-use. Then improve the customer experience, and lastly implement the Direct Online Sale between business to consumer by implement electronic payment methods. All thesetechniques should be based on deliberated plan according to strategy of electronic commercewith implement the current technology to ensure a good revenue to the company.

## Keywords

E-Commerce, Sales, E- Business, Customer Relation, Behavior.

**ICIRIST-FLP-ABS-EO9**

# LOW POWER LOSSY NETWORKS FOR ROUTING PROTOCOLS

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## ABSTRACT

Low Power and Lossy Networks (LLNs), characterized by resource-constrained nodes, present challenges such as high packet loss rates, low data rates, and instability. Wireless Sensor Networks (WSNs), a subset of LLNs, play a crucial role in remote data collection, particularly in fields like environment monitoring and fire early warning systems. As WSNs are often powered by batteries, their energy efficiency directly impacts network longevity. The Routing Protocol for Low Power and Lossy Networks (RPL) is designed to address these challenges, but its performance degrades under wireless interference. This study proposes a modified DODAG discovery process to mitigate packet loss impact. Additionally, a Quality of Information (QoI)-aware local DODAG discovery method is introduced, optimizing network topology and reducing energy consumption in RPL-based event detection WSNs. The approach involves selecting appropriate parent nodes, improving DODAG structure in noisy environments, and fusing/transmitting sensor data based on QoI, thereby enhancing energy efficiency while maintaining information quality.

## Keywords

packet loss rates, routing protocol, Quality of Information(QoI), DODAG.

**ICIRIST-FLP-ABS-E010**

# CREDIT CARD FRAUD DETECTION USING MACHINE LEARNING ALGORITHM

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## ABSTRACT

Credit card fraud is detected using machine learning algorithms in this project. First, standard models are used. Presently utilized half and half model utilized. Based on bidirectional Long short-term memory (BiLSTM) and bidirectional Gated recurrent unit (BiGRU), our model is BiLSTM-MaxPooling-BiGRUMaxPooling. We additionally applied six AI classifiers which are: Credulous base, Casting a ballot, Ada helping, Irregular Timberland, Choice Tree, and Strategic Relapse.To assess the model viability, a freely accessible Mastercard informational index is utilized.After that, a real-world credit card data set from a bank is looked at.Positive findings from the experiment indicate that credit card fraud cases can be detected with high accuracy using the majority voting method. Extortion is an unfair or criminal double dealing meant to bring monetary or individual increase. In keeping away from misfortune from extortion, two systems can be utilized: misrepresentation anticipation and extortion location. Preventing fraud from occurring in the first place is the goal of fraud prevention, which is a proactive approach. However, when a fraudster attempts to conduct a fraudulent transaction, fraud detection is required. Visa extortion is worried about the unlawful utilization of Mastercard data for buys. Charge card exchanges can be achieved either genuinely or carefully.

## Keywords

Machine Learning , Credit Card, Fraud Detection , Classification

**ICIRIST-FLP-ABS-E011**

# REAL TIME DRIVER DROWSINESS DETECTION USING MACHINE LEARNING

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## ABSTRACT

Drowsiness of driver's is one of the significant cause of road accidents. Every year, there is an increase in the amount of deaths and fatal injuries globally. By detecting the driver's drowsiness, road accidents can be reduced. This paper describes a machine learning approach for drowsiness detection. Face detection is employed to locate the regions of the driver's eyes, which are used as the templates for eye tracking in subsequent frames. Finally, the tracked eyes images are used for drowsiness detection in order to generate warning alarms. This proposed approach has three stages: detecting Face, detecting Eyesand detecting drowsiness. Image processing is used to recognize the face of the driver and then its extractsthe image of the eyes of the driver for detection of drowsiness. The HAAR face detection algorithm takes as captured frames of image and then the detected face is considered as output. Next, CHT is used for tracking eyes from the detected face. Using EAR (Eye Aspect Ratio) the eye state is detected. The proposed system was tested by implementing the proposed approach on a Raspberry pi 3 Model B with 1GB RAM with use of Logitech HD Webcam C270. The system uses frames for face and eye tracking, and the average correct rate for eye location and tracking could achieve 95.0% based on some test videos. Thus, the proposed approach for a real-time of driver drowsiness detection is a low cost and effective solution method.

## Keywords

Driver Monitoring System; Drowsiness Detection; Deep Learning; Real-time Deep Neural Network; Android.

## ICIRIST-FLP-ABS-E012

# IOT BASED BATTERY MONITORING SYSTEM IN ELECTRIC VEHICLE


### ABSTRACT

As electric vehicles become more popular, it's crucial to monitor the health and performance of their batteries to ensure optimal efficiency and longevity. In this paper, we propose an IoT-based battery monitoring system that leverages wireless communication and cloud computing to collect and analyze battery data in real-time. Our system consists of three main components: battery sensors, a gateway device, and a cloud platform. The battery sensors are placed in each battery cell to measure key parameters such as voltage, current, temperature, and state of charge. These sensors transmit data wirelessly to the gateway device, which aggregates and processes the data before sending it to the cloud platform. Our system offers several benefits, including improved battery performance, reduced maintenance costs, and enhanced safety. By leveraging IoT and cloud technologies, we can provide real-time monitoring and analysis of battery data, enabling more informed decision-making and proactive maintenance. At the present time, the resources that we use for electricity are costly and inefficient. That is why we must rely on those that are of in the least harmful to the environment and inexpensive. There are also additional benefits: Photo voltaic panels and photovoltaic plants use the naturals un-light for additional lighting. photovoltaic cells are used in applications that allow the use of taking solar energy and expanding it into electricity most of the solar systems are situated in sparsely populated regions, large-scale agricultural communities, as well as in medium-sized farm sites and smaller, agricultural local agricultural production facilities that have power grids For a machine to function, it must be operated by a human. This is a hardware- timed sensor system that tracks various variables, like temperature, voltage, and fire and battery percentage and reports them on the cloud so you can see exactly when everything has reached the right value.

**ICIRIST-FLP-ABS-E013**

# SMART NAVIGATION AND ENERGY MANAGEMENT FRAMEWORK FOR AUTONOMOUS ELECTRIC VEHICLES IN COMPLEX ENVIRONMENTS


## ABSTRACT

Autonomous Electric Vehicles (AEVs) are revolutionizing the world of smart city transportation due to their low resource consumption, improved traffic efficiency, zero carbon emissions, and improved road safety. To ensure the safe passage of vehicles through a complex environment, it is essential to plan for safe and smart navigation and energy management for AEVs. This demands an effective model for locating the optimal Electric Charging Stations (ECS) for scheduling and recharging the AEVs when they run on low battery. Many research works, however, do not focus on navigation and scheduling policies for AEV charging that would occur in extreme events in complex environments. The electric vehicles are convenient technologies to reduce fuel cost and environmental emissions. The gasoline price always comprises fluctuations but the electricity price is much more stable. The electricity price is also less expensive than gasoline. As a result, electric vehicles are convenience technologies to reduce fuel cost. The electricity costs and environmental pollution are the other targets that can be minimized by optimal charging-discharging of electric vehicles. The number of Electrical Vehicle (EV) charging stations are steadily increasing everyday as electric vehicles become more popular. With the proliferation of electric vehicles and their predicted sales growth in the near future, battery recharging will pose many challenges. In this paper we will introduce a smart power meter to recharge the electric vehicle. IOT technology is implemented to handle the electric vehicle (EV) recharging process. The proposed EV charging station draws current from the utility grid at low total harmonic distortion (THD). The optimal charging discharging pattern of electric vehicles reduces the economic cost of the unit commitment problem.

**ICIRIST-FLP-ABS-E014**

# A MACHINE LEARNING BASED CLASSIFICATION AND PREDICTION TECHNIQUE FOR DDOS ATTACKS

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## ABSTRACT

Distributed Denial of Service (DDoS) attacks are the most common name for distributed network attacks. These attacks make use of restrictions on any arrangement asset, like the structure of the authorized organization's website, which they exploit. In the current exploration study, the creator chipped away at an old KDD dataset. It is important to work with the most recent dataset to distinguish the present status of DDoS assaults. For the classification and prediction of DDoS attack types, this paper utilized a machine learning strategy. The classication algorithms Random Forest and XGBoost were utilized for this purpose. To get to the exploration proposed a total structure for DDoS assaults expectation. Python was used as a simulator and the UNWS-np-15 dataset was extracted from the GitHub repository for the proposed work. For the purpose of determining the performance of the machine learning models, we produced a confusion matrix following their application. In the main order, the outcomes showed that both Accuracy (PR) and Review (RE) are 89% for the Irregular Woods calculation. The proposed model's AC is 89% on average, which is excellent and sufficient. The XGBoost algorithm's Precision (PR) and Recall (RE) were found to be approximately 90% for the second classification. Our suggested model has an AC of 90% on average. The accuracy of defect determination was significantly improved by approximately 85 percent and 79 percent when compared to previous research.

## Keywords

Ddos , Dos, Ai , Xgboost, Machine Learning, Prediction Of Dos Attacks

**ICIRIST-FLP-ABS-E015**

# PREDICTING EMOTIONS FROM TEXT USING COMPUTING TECHNIQUE

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## ABSTRACT

Emotions play a vibrant role in the discussion, as they convey the context of the conversation. Text/word in conversation comprises of lexical and contextual meanings. Identifying emotions using the text is an intriguing task in recent times. With the progress of soft computing techniques and hardware to support the machine learning process, detecting emotions from text with the support of machine learning yields promising and noteworthy outcomes. We suggest a real-time text communication system based on individuals' conversations. The primary challenge for an emotion detection system is efficient feature extraction. It entails improving effective communication between individuals. The developed system achieved an impressive result of 99.25% happiness, 90% surprise, and 80% sadness.

## Keywords

Emotion Detection, Machine Learning, CNN, NLP, Stemming, Emotional Intelligence.

**ICIRIST-FLP-ABS-E016**

# FUZZY CLUSTERING BASED CROP YIELD PREDICTION WITH STRUCTURED ASPECT OF SEGMENTING

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## ABSTRACT

In the growth of economy the agriculture plays an important role and the production of the crop is dependent upon some natural factors like water, soil, fertility, etc. The soil fertility is a significant source of nutrients that are needed for plant growth. Machine Learning (ML) is a dynamic approach in the digital world for analyzing large datasets to obtain efficient results through data mining. The proposed system has been taken the soil nutrients of large datasets to suggest suitable fertilizer using advanced machine learning algorithms with data mining. The proposed method of Machine Learning algorithm of Hybrid Quantization Cascaded Neural Network (HQ-CNN) is used to analyze the soil fertility by soil nutrients. In agriculture, Soil fertility is fundamental for crop production, essential to measure the quality of the soil and this depends upon the capacity of soil nutrients. There are three major soil nutrients are nitrogen (N), phosphorus (P), and potassium (K) and this together defined as NPK this is obtained in the soil. The proposed research aims at restoring the levels of Nitrogen, phosphorous, potassium in the soil by measuring the number of nutrients present. This paper focuses on recommending soil fertility by using Machine learning classifier algorithms such as HQ-CNN as a learner for crop production with efficiency and high accuracy through soil nutrients. The machine learning approaches combined with data mining brings out the novel ways in improving the accuracy of classifying soil nutrients analysis to recommend soil fertility. For evaluation propose loss measurement is declared as root relative square error (RRSE), Mean Bias Error (MBE), and statistical measures are noticed.

## Keywords

Machine Learning, Data Mining, Soil Nutrients, HQC-NN algorithm, Recommend Fertilizer.

**ICIRIST-FLP-ABS-E017**

# CROP RECOMMENDER SYSTEM USING MACHINE LEARNING

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## ABSTRACT

Farming and its partnered areas are without a doubt the biggest suppliers of livelihoods in country India. The horticulture area is likewise a huge donor component to the nation's GDP (Gross domestic product). Gift to the nation is the mind-boggling size of the horticultural area. Nonetheless, unfortunate is the yield per hectare of harvests in contrast with worldwide principles. This is one of the potential foundations for a higher self destruction rate among peripheral ranchers in India. This paper proposes a suitable and easy to understand yield expectation framework for the ranchers. The proposed framework gives network to ranchers through a portable application. GPS assists with distinguishing the client area. The client gives the region and soil type as information. AI calculations permit picking the most productive harvest list or foreseeing the harvest yield for a client chose crop. To foresee the harvest yield, chose AI calculations, for example, Support Vector Machine (SVM), Artificial Neural Network (ANN), Random Forest (RF), Multivariate Linear Regression (MLR), and K-Nearest Neighbour (KNN) are used. Among them, the Random Forest showed the best results with 95% quality. Moreover, the framework likewise proposes the best opportunity to utilize the manures to support up the yield.

## Keywords

Mahine Learinig , Crop Recommendation, Datascience

**ICIRIST-FLP-ABS-E018**

# STRUCTURAL ANALYSIS OF AIRCRAFT WING USING ANSYS WORKBENCH

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## ABSTRACT

Structural analysis is an important part of the design and development of the aircraft structure. Design of airplanes depends on their wings for flight. The wing of an airplane is one of the most important and complicated element. The wings are themost important lift-producing part of the aircraft. Wings vary in design depending upon the aircraft type and its purpose. A wing is a type of fin with a surface that produces aerodynamic force for flight through the atmosphere. The lift force is directed upwards and is acting perpendicular to the displacement of the wing and the drag force is exerted in the direction opposed to the displacement of the plane. Hence, this presentation includes the detailed analysis of the structural analysis of wing. The main purpose of this project is to find out which Aerofoil (NACA4415 and NACA4418) is best suited for making of wing for subsonic flight. Inthis the NACA-4 digit series is used for making wing skeletonstructure and later we made modellingandstructural analysis on wing Skelton structure by using ANSYS WORKBENCH. Structural analysis of the wing is carried out to compute the stresses due to pressure and various loads. The modelling, analysis and stresses are estimated using the Ansys software.

## Keywords

Aircraft wing, NACA4415, NACA4418 Structural steel, ANSYS workbench.

**ICIRIST-FLP-ABS-E19**

# LICENSE PLATE DETECTIONAND RECOGNITION

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## ABSTRACT

A Automatic License Plate detection and Recognition (ALPR) is a quite popular and active research topic in the field of compute vision, image processing and intelligent transport systems. ALPR is used to make detection and recognition processes more robust and efficient in highly complicated environments and backgrounds. Several research investigations are still necessary due to some constraints such as: completeness of numbering systems of countries, different colors, various languages, multiple sizes, and varied fonts. For this, we present in this paper an automatic framework for License Plate (LP) detection and recognition from complex scenes. Our framework is based on mask region convolutional neural networks used for LP detection, segmentation, and recognition. Although some studies have focused on LP detection, LP recognition, LP segmentation or just two of them, our study uses the maskr-cnn in the three stages. The evaluation of our framework is enhanced by four datasets for different countries and consequently with various languages. In fact, it tested on four datasets including images captured from multiple scenes under numerous conditions such as varied orientation, poor quality images, blurred images and complex environmental backgrounds. Extensive experiments show the robustness and efficiency of our suggested framework in all datasets.

**Keywords**

LP detection, LP recognition, Deep learning, Mask RCNN

**ICIRIST-FLP-ABS-E020**

# DEVELOP A DEEP LEARNING ALGORITHM FOR SPEECH SIGNAL DEREVRBERATION

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## ABSTRACT

A Speech signal captured by distant microphones in area includes reverberation similarly as noise. It worsens the received signal quality. To recover the first signal, it's necessary to eliminate reverberation and noise. By dereverberation technique reverberation is removed and target speech signal is recovered from received tinkly signal. The reverberation similarly as noise is removed by incorporating Generalized Sidelobe Canceller (GSC) along with side post filter enforced victimization Wiener filter. it's through an experiment verified that, the meant approach improves speech quality in tinkly, rackety surroundings for variations in reverberation time, signal to noise magnitude relation (SNR) and distance between supply to electro- acoustic transducer array.

## Keywords

Dereverberation, Beamforming, GSC, Wiener Filter, Linearly Constrained Minimum Variance (LCMV).

**ICIRIST-FLP-ABS-E21**

# REAL TIME ANALYSIS ON THE CONTROL OF REVERSE OSMOSIS SYSTEM USING PID CONTROL MECHANISM

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## ABSTRACT

The Reverse Osmosis (RO) process is widely used for water treatment and purification due to its effectiveness in removing impurities and producing high-quality water. Implementing PID control in a Reverse Osmosis (RO) process involves using a PID controller to regulate key parameters such as pressure, flow rate, and concentration to ensure optimal performance and water quality. By applying PID control to an RO process, you can enhance the system's efficiency, maintain stable operating conditions, and achieve the desired water quality. Keep in mind that tuning PID controllers may require some trial and error, and it's important to consider the specific characteristics of the RO system being controlled.

**Keywords**

Reverse osmosis, purification, PID control strategy, time domain analysis, error estimation, etc.

**ICIRIST-FLP-ABS-E22**

# PPSB: AN OPEN & PLATFORM FOR PRIVACY PRESERVING SAFE BROWSING

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## ABSTRACT

The approach of arising processing advancements, for example, administration situated design and distributed computing has empowered us to perform business benefits all the more productively and viably. In any case, we actually experience the ill effects of unintended security spillages by unapproved activities in business administrations. Firewalls are the most generally sent security system to guarantee the security of private organizations in many organizations and foundations. The viability of security assurance gave by a firewall chiefly relies upon the nature of strategy designed in the firewall. Shockingly, planning and overseeing firewall approaches are frequently mistake inclined because of the perplexing idea of firewall setups just as the absence of methodical examination instruments and devices. In this paper, we speak to a creative approach abnormality the board structure for firewalls, embracing a standard based division method to recognize strategy irregularities and infer viable peculiarity goals. Specifically, we articulate a network based portrayal procedure, giving an instinctive intellectual sense about strategy inconsistency. We additionally examine a proof-of-idea execution of a representation based firewall strategy investigation instrument called Firewall Anomaly Management Environment (FAME). Moreover, we show how effectively our methodology can find and resolve peculiarities in firewall arrangements through thorough trials.

## Keywords

Privacy preserving, safe browsing, web browser, malware, phishing

**ICIRIST-FLP-ABS-E23**

# Design and Parametric Analysis of a Rectangular Micro Strip Patch Antenna for Robotic Applications

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## ABSTRACT

At 882 MHz, a simple rectangular micro strip patch antenna was implemented especially for the industrial robotic applications.FR4with a dielectric constant of 4.4 was chosen as the dielectric substrate material. The projected antenna has been modelled using the Finite Element Method (FME). Later, the antenna was fabricated and tested with a vector network analyzer. The antenna feed line (transmission line) at various distances from its right edge was investigated for good impedance matching in the resonant frequency band. Finally, to converts antenna load impedance ($zL$) to a 50 $\Omega$characteristics impedance, a quarter wavelength transformer was used. After determining good agreement between FME-based and measured antenna results, the radiation pattern of the proposed antenna was measured practically at the E and H- planes at 870 MHz, 880 MHz, and 890 MHz.

## Keywords

Microstrip Patch antenna, Quarter wavelength transformer, Printed monopole, Robotics antenna. Compact industrial antenna**.**

# Research Paper Presentations – II

**ICIRIST-FLP-ABS-01**

# A STUDY ON DIGITAL TRANSFORMATION IN EDUCATION

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## ABSTRACT

In modern conditions, the content of education requires updating and reaching the educational process to a completely new qualitative level. Many educational institutions are actively using digital technologies in their educational process. Based on the study of domestic and foreign literary sources, examples of the use of digital resources in the field of preschool, secondary and higher education are given. The authors of this article focus on the need not only to improve the quality of subject knowledge and master new competencies, but also the special role of working with young people in terms of educating and shaping a young person as a responsible and harmonious personality. The important directions of educational work in the process of training and education are determined. The paper presents approaches to the individual design of education and the requirements of digital education in general. The qualities that schoolchildren and students must possess for successful educational activities are listed. The authors have identified the main advantages and disadvantages of the digitalization of the educational process in educational institutions. The relevance of the study is dictated by the need to determine the main trends in the development of education in modern conditions. Innovations in the educational process associated with the introduction of digital technologies, at this stage of the development of education, need to be finalized and changed, taking into account the existing experience and strategic goals for the education and upbringing of the younger generation.

**ICIRIST-FLP-ABS-02**

# DIGITAL TRANSFORMATION IN SUPPLY CHAIN MANAGEMENT ENHANCING EFFICIENCY AND RESILIENCE

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## ABSTRACT

The landscape of supply chain management is undergoing a revolutionary shift driven by digital transformation. This abstract explores the multifaceted dimensions of this transformation, with a specific focus on how it enhances efficiency and resilience within the supply chain. As industries adapt to the demands of the digital era, leveraging advanced technologies such as artificial intelligence, the Internet of Things (Iot), block chain, and data analytics becomes imperative for optimizing operations. The integration of these technologies fosters efficiency by streamlining processes, automating routine tasks, and providing real-time visibility into the entire supply chain. Artificial intelligence, for instance, enables predictive analytics, allowing organizations to forecast demand, optimize inventory levels, and enhance overall decision-making. The lot facilitates the creation of smart, interconnected supply chain networks, enabling stakeholders to monitor and control various elements of the supply chain remotely. Moreover, blockchain technology ensures transparency, traceability, and security in transactions, thereby reducing the risk of fraud and errors. In addition to efficiency gains, digital transformation significantly contributes to building resilience in supply chains. The ability to quickly adapt to disruptions, whether caused by natural disasters, geopolitical events, or unexpected market shifts, is a critical aspect of modern supply chain management. Advanced technologies enable real-time risk monitoring and mitigation strategies, empowering organizations to proactively respond to disruptions and make informed decisions to safeguard the continuity of their operations. The use of data analytics in risk management enhances the supply chain's ability to identify vulnerabilities and establish contingency plans.

**ICIRIST-FLP-ABS-03**

# A STUDY ON DIGITAL MARKETING IN BUSINESS GROWTH

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## ABSTRACT

The world is shifting from analog to digital and marketing is no exception. As technology development is increasing, the use of digital marketing, social media marketing, search engine marketing is also increasing. Internet users are increasing rapidly and digital marketing has profited the most because it mainly depends on the internet. Consumer's buying behavior is changing and they are more inclined towards digital marketing rather than traditional marketing. The purpose of this review paper is to study the impact of digital marketing and how important it is for both consumers and marketers. This paper begins with an introduction of digital marketing and then it highlights the mediums of digital marketing, the difference between traditional and digital marketing, and the pros, cons, and importance of digital marketing in today's era. Digital marketing is the marketing of products or services using digital technologies, mainly on the Internet, but also including mobile phones, display advertising, and any other digital medium. Digital marketing's development since the 1990s and 2000s has changed the way brands and businesses use technology for marketing. As digital platforms are increasingly incorporated into marketing plans and everyday life, and as people use digital devices instead of visiting physical shops, digital marketing campaigns are becoming more prevalent and efficient. This paper mainly focuses on conceptual understanding of digital marketing, how digital marketing helps today's business and some cases in the form of examples.

## Keywords

Digital marketing, Internet, Online Advertising, Internet marketing, Media, Key performance indicators, Mail, Search Engines, Consumers.

**ICIRIST-FLP-ABS-04**

# ANTAGONISTS SPECIFICALLY TARGETING ANTI-APOPTOTIC MEMBERS OF BCL-2 FAMILY PROTEINS AS EVALUATED BY COMPUTATIONAL METHODS

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## ABSTRACT

Maintaining cell homeostasis is critical for the proper functioning of higher eukaryotic organisms, where imbalances in cell death and survival mechanisms can lead to neurodegenerative diseases or cancers. Cancers, characterized by uncontrolled cell proliferation and impaired apoptosis, are influenced by genetic and environmental factors. The Bcl-2 family of proteins plays a pivotal role in regulating apoptosis through intrinsic and extrinsic pathways. This study explores the design of small molecular antagonists targeting anti-apoptotic Bcl-2 family proteins such as Bcl-XL, Mcl-1 and Bcl-B using In silico methods. The study highlighted the importance of considering structural differences in the BH3-binding grooves of Bcl-XL and Mcl-1 to achieve specificity in antagonist design. For Bcl-B, a novel computational strategy, the peptidodynmimetic method, was successfully employed. Cumulatively, this study contributes to the development of precise antagonists for anti-apoptotic proteins, offering potential advancements in cancer chemotherapy. The integration of computational methods enriches the comprehension of protein-ligand interactions, thereby guiding the formulation of novel therapeutic strategies with enhanced efficacy.

**Keywords**

Antagonists, Anti-Cancer, Bcl-2, Drug Design and Therapeutics

**ICIRIST-FLP-ABS-05**

# DESIGN A CIRCULARLY POLARIZED HEART SHAPED INVERTED L SLOT MICRO STRIP PATCH ANTENNA FOR WI-FI COMMUNICATION

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## ABSTRACT

A hybrid patch antenna featuring a reduced slot-loaded ground plane and a broadband "HEART" form is suggested in this article. A standard circular patch can be effectively upgraded to a "HEART" shape by positioning two circular radiating pieces at key locations on the patch. An inverted L-shaped slot should be present on all four sides of the "HEART"-shaped substrate. Two precisely positioned rectangular holes on the decreased ground plane allow for proper impedance matching over a variety of frequencies. These methods work together to introduce high gain, low profile, and broadband antenna design. The electrical and physical dimensions of the proposed antenna are 0.266λ × 0.241λ × 0.0108λ and 29 mm × 32 mm × 1.6 mm, respectively. The wavelength of the minimum operational frequency is indicated by the symbol λ. With an impedance bandwidth of 5 GHz from (13 GHz to 17.4 GHz), the suggested antenna resonantly functions at 13 GHz, 21.3 GHz, 20 GHz, 24.8 GHz, 18.3 GHz, 17.1 GHz, 16.5 GHz, and 17.4 GHz frequencies. 100% fractional bandwidth, a peak gain of 2.5dBi, and adequate stable E and H field patterns are attained at 21.3 GHz and 24.8 GHz. On the other hand, the design and simulation of the displayed antenna are done using HFSS software. The recommended antenna is designed using the low-cost FR-4 substrate (1.6 mm in height, 0.02 loss tangent, 4.4 dielectric constant). After that, it is investigated with a standard microwave measurement device. A wide range of frequency bands could find application for the proposed antenna, including WiMAX (3.4–3.6 GHz and 5.5 GHz), from 3.3 GHz to 4.2 GHz n77 frequency band, from 3.3 GHz to 3.8 GHz n78 frequency band, from 4.4 GHz to 5 GHz n79 frequency band, and from 5.08 GHz to 5.73 GHz Wireless local area network frequency band. It also covers the 5G-V2X band (3.3-5GHz) and LTE 46 band (5.15-5.925GHz), object placement, high-bandwidth communications, and short-range remote sensing. Index Terms: micro strip patch antenna, equivalent circuit, hybrid, broadband.

**ICIRIST-FLP-ABS-06**

# INCUBATOR FOR PREMATURE BABIES IN RURAL AREAS

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## ABSTRACT

Through this project, we seek to reduce infant mortality rates and promote community awareness about neonatal care. By making incubators accessible in underserved areas, we aim to contribute to equitable healthcare access, ensuring that even the most vulnerable infants have the opportunity to thrive. This abstract highlight the importance of this initiative in enhancing the health and well-being of premature babies born in rural communities. By making incubators accessible in rural areas, we hope to empower these communities to provide essential care to their youngest residents, fostering a healthier and more promising future for premature babies. The system's sustainability is driven by solar panel energy, reducing reliance on conventional power sources. Should solar energy become insufficient, a seamlessly integrated battery backup ensures uninterrupted care. Furthermore, a relay system efficiently manages power distribution between the solar panel and AC source, guaranteeing continuous support for the infant. This integrated approach revolutionizes neonatal care, combining advanced technology with eco-conscious practices, setting a new standard for safety, comfort, and environmental responsibility in healthcare facilities. This abstract underscores the significance of this endeavor in improving the health outcomes of premature infants born in underserved rural areas and emphasizes its potential to drive positive change in healthcare disparities.

## Keywords

Incubator, infant mortality rate, neonatal, premature babies, sustainability, conventional

**ICIRIST-FLP-ABS-07**

# A STUDY ON ONLINE CUSTOMER RELATIONSHIP MANAGEMENT PRACTICE TOWARDS CUSTOMERS' SATISFACTION IN SUPER MARKET-ARIYALUR

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## ABSTRACT

Customer Relationship Management (CRM) is an enterprise-broad business strategy practice directed at attracting, retaining and effectively serving customers to grow up their state of values over the long term. Developing business is never end process and CRM is playing a vital role in success of the business. It is not an exemption. CRM is quite a new phenomenon in retailing industry. The purpose of the study is satisfaction level of customers of the respective super market and finally to determine the relationship between CRM practices adopted by the super market and loyalty of their customers. The study conducted Tiruchirappalli district with 200 respondents, and each 50 respondent from selected four super markers (FSM, Reliance, Kavery, Kumudham) stores. The study was descriptive in nature so questionnaire method was adopted. The result shows that, increasing CRM practices in retail industry will be have bright future with role in providing better quality services to understand which built customer satisfaction and fulfill their expectation.

**Keywords**

CRM practices, Retail Industry, customer satisfaction.

**ICIRIST-FLP-ABS-08**

# DETECTION OF METASTABLE DENATURED STATES IN UBIQUITIN UNDER ITS NATIVE CONDITIONS

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## ABSTRACT

The free energy of unfolding ($\Delta G_U$) determined through optical methods and the free energy of exchange ($\Delta G_{HX}$) measured by Nuclear Magnetic Resonance (NMR) assisted hydrogen-deuterium (H/D) exchange methods for ubiquitin at pH 9.2 were found to be 6.2 kcal/mol and 9.5 kcal/mol, respectively. The discrepancy of approximately 3.3 kcal/mol between the $\Delta G_{HX}$ and the $\Delta G_U$ at pH 9.2 could not be entirely explained due to *cis-trans* proline isomerization in ubiquitin during the transition to the unfolded protein state. The study indicates that this discrepancy could be linked to the presence of metastable denatured states within ubiquitin when analyzing the exchange data under different pH conditions, accounting for both the EX1 and EX2 exchange reactions. These metastable states likely involve a limited range of conformations, transitioning from a transition state to a broader distribution of conformations characteristic of the denatured ground state.

## Keywords

Free Energy, Hydrogen-Deuterium Exchange, Metastable Denatured States, Protein folding and Transition states.

**ICIRIST-FLP-ABS-09**

# AN EXPERIMENTAL STUDY ON PURIFICATION OF GREYWATER BY USING MORINGA OLEIFERA

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## ABSTRACT

The main abstract of our project is to purify the kitchen waste water by using natural coagulants. Over a past few years, water treatment plants use a variet) of chemicals to remove contaminants that affect the taste, odour and overall safety of the water. So we use the natural coagulants like drumstick seed to reduce the turbidity of the kitchen waste miter. The natural coagulant is a natural based coagulant that can be used in coagulation process of water treatment for reducing the turbidity, odour etc. Once the coagulant is introduced in the water, the individual colloids must aggregate and grow bigger so that the impurities can be settled down at the bottom of the beaker and separated from the water suspension. Iron coagulants are commonly used in most industries. However, when Iron coagulants is used as a coagulant in waste water treatment, it can caused several bad effect on human health such as intestinal constipation, loss of memory, convulsions, abdominal colic's, loss of energy and learning difficulties. Hence nowadays, there has been great attention in the improvement and implementation of natural coagulants in wastewater treatment. These natural coagulants can be formed or extracted from animal, microorganisms and also plant. Natural coagulants used for our study are Moringa Oleifera are locally available from vegetables and seeds.

**Keywords**

Moringa oleifera, Natural coagulant

**ICIRIST-FLP-ABS-010**

# LEADERSHIP CHALLENGES IN REMOTE WORK ENVIRONMENTS

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## ABSTRACT

The pervasive influence of remote work on contemporary professional landscapes has prompted a comprehensive exploration of its ramifications, particularly in the realm of leadership. This abstract encapsulates the essence of a journal report that investigates the intricate challenges confronted by leaders in remote work environments. Leveraging a synthesis of empirical studies, theoretical frameworks, and real-world case studies, the report aims to unravel the multifaceted dynamics of communication, trust-building, employee engagement, and performance management in the virtual workspace. As organizations navigate the evolving landscape shaped by technological advancements and global circumstances, leaders find themselves at the forefront of a transformative journey. The report underscores the centrality of effective communication in virtual settings, examining its impact on team dynamics, collaboration, and the potential misinterpretation of messages. Building and maintaining trust, a cornerstone of successful leadership, takes on heightened significance in geographically dispersed teams. The nuances of employee engagement and the challenges associated with performance management in remote settings are also dissected, offering insights into fostering motivation, teamwork, and results-driven evaluations. In addition to synthesizing existing literature and theoretical frameworks, the report incorporates real-world case studies from diverse industries. These cases illustrate successful strategies employed by organizations and leaders to address and overcome remote leadership challenges. The practical recommendations distilled from these insights provide leaders with actionable steps to enhance their effectiveness in the digital era. Looking ahead, the abstract contemplates emerging trends in remote work and their implications for leadership. The fusions of timeless leadership principles with contemporary digital acumen emerges as a recurrent theme, as organizations transition towards hybrid work models and integrate advanced technologies. The report concludes by emphasizing the critical role of adaptive leadership, urging leaders to remain agile, empathetic, and forward-thinking in their pursuit of success in the ever-evolving landscape of remote work. In essence, this journal report aims to serve as a valuable resource for leaders, researchers, and organizations seeking to navigate the complexities of remote leadership successfully. Through its comprehensive examination and practical insights, the report strives to contribute to the ongoing dialogue surrounding effective leadership in the dynamic and transformative world of remote work.

**ICIRIST-FLP-ABS-011**

# TRAINING AND DEVELOPMENT IN A POST-COVID-19 WORKPLACE

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## ABSTRACT

Intelligent businesses have been raising harsh questions regarding conventional approaches to schooling and the growth of their workers since long before our current crisis. The fantasy of "all-online digital learning" at the beginning of the 21st century has largely failed, particularly because some of the most critical management skills are better taught and trained in person. "The soft thing," it points out, is really the hard thing, and managers who are involved in improving behavioral abilities and emotional maturity, and the capacity to interact and control others would not significantly advance with an online module. That being said, the completely unpredictable path of transition in 2020 causes us all to reconsider how we can improve and prepare our staff and construct and expand our organizational and cultural capability while we actually cannot get together in person. Leadership development takes on added significance in nurturing resilience and effective communication amidst uncertainty. E-learning platforms facilitate flexible, self-paced learning, accommodating diverse schedules and preferences. Tailoring training content to address mental health and well-being also plays a crucial role in supporting employees during challenging times. In this transformed workplace, adaptability is a key competency. Training modules focusing on problem-solving, creativity, and change management empower employees to thrive in dynamic environments. Regular assessments and feedback loops ensure the relevance and efficacy of training initiatives.

**ICIRIST-FLP-ABS-012**

# THE COPPER(II) COMPLEXES WITH MIXED LIGANDS OF 1, 10-PHENANTHROLINE / 2-2' BIPYRIDYL, L-METHIONINE AND ETHYLAMINE : SYNTHESIS, CHARACTERIZATION AND DNA BINDING

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## ABSTRACT

The ternary copper(II) complexes [Cu(phen)(L-met)EA)] 1 & [Cu(Bpy)(L-met)EA] 2 ( phen = 1,10-phenanthroline Bpy = bipyridyl, L- Methionine and EA= Ethylamine), have been synthesized and characterized by CHN analysis molar conductance, electronic absorption, IR and EPR spectral studies. They have been tested for their in vitro DNA binding activities by the spectroscopic methods. Further, complexes 1 and 2 displayed significant cytotoxicity when examined in-vitro on a panel of cancerous cell line -human liver cancer cell line -HepG-2 cells (IC50= 40.85 and 29.84 µg/ml). Further complexes 1 & 2 were tested for their antimicrobial activities and it was found to have good antimicrobial activities.

## Keywords

Copper (II) Complexes, L-Methionine, Thiourea, DNA Binding & Cytotoxicity

**ICIRIST-FLP-ABS-013**

# BLOCKCHAIN ENABLED INTRUSION DETECTION IN INTERNET OF THINGS NETWORKS

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## ABSTRACT

The Internet of Things (IoT) is expanding widely whereas the security of the network against the intruders becoming a challenge. This article discovers the application of blockchain technology towards identifying and mitigating intruders in the IoT networks. The blockchain's decentralized and immutable ledger capabilities are employed in this research to enhance security measures. The proposed methodology involves the use of smart contracts deployed on a blockchain network to monitor and validate device interactions within the IoT ecosystem. The devices are assigned unique identity stored on the blockchain by ensuring tamper-resistant record of the device activities. In the event of suspicious behavior, the smart contracts automatically trigger alerts and initiate response protocols. A smart home scenario is illustrated to showcase the effectiveness of this methodology. The environment is equipped with various IoT devices, from smart thermostats to security cameras. Through the implementation of blockchain, each device is registered on the blockchain network, forming an interconnected web of trust. If an unauthorized user attempts to manipulate a device or gain unauthorized access, the blockchain's immutable ledger records and broadcasts the anomaly. The methodology presented demonstrates the potential for blockchain to revolutionize IoT security practices, ensuring the integrity and trustworthiness of connected devices in an increasingly interconnected world.

**Keywords**
Internet of Things; Blockchain; smart contract; immutable ledger; intruder

**ICIRIST-FLP-ABS-014**

# DESIGN AND IMPLEMENTATION OF AN IMPROVED WATCHDOG TIMER

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**ABSTRACT**

Highest dependability is required for embedded systems used in safety-critical applications. These systems employ external watchdog clocks to automatically handle and recover from problems related to operating time. The majorities of external watchdog clocks on the market have restricted functionality and need extra hardware to modify their timeout durations. The architecture and design of a better programmable watchdog timer that may be used in situations where safety is a top priority are described in this study. The watchdog has many built-in defect detection algorithms, which increases its resilience. It may be used to monitor the activities of any processor-based real-time system because of its very generic capabilities and operations. The use of the suggested watchdog timer in a Field Programmable Gate Array (FPGA) is also covered in this study. This lowers the total system cost and makes it simple to adapt the design to various applications. First, the simulation results are analyzed in order to determine how well the suggested watchdog timer detects and responds to errors. Therefore, the watchdog is designed, implemented, and validated in the ATM. When the processor is operating, errors are introduced into the programme to validate the design in real-time hardware.

**ICIRIST-FLP-ABS-015**

# DEVELOPMENT OF AN INTEGRATED GAS DETECTION SYSTEM WITH EMBEDDED SENSOR FUSION AND REAL-TIME DATA ANALYSIS

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## ABSTRACT

This paper outlines the hardware implementation of a sophisticated Liquefied Petroleum Gas (LPG) detection and monitoring system utilizing a microcontroller and an Android application. The system is designed to efficiently monitor LPG levels within a confined space and transmit real-time data to a mobile device via a 2.4 GHz ZigBee-based Bluetooth module. The MQ-6 LPG sensor is employed for accurate monitoring, relaying the data to the ATmega16 microcontroller, which subsequently transfers it to the user's smartphone through an HC-05 Bluetooth module. The smartphone is equipped with a purpose-designed Android application that not only displays the gas levels in real-time but also offers control options for an exhaust fan and electrical switch.

**Keywords**
LPG, ATmega16, Bluetooth, Android.

**ICIRIST-FLP-ABS-016**

# A REVIEW OF ELECTRICAL DISCHARGE MACHINING (EDM) WITH RESPONSES

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## ABSTRACT

High precision items are manufactured in industry using the non-traditional, non-contact electro discharge machining (EDM) technology. Since EDM can melt any electrically conductive material regardless of hardness, it is well recognized for cutting hard and brittle conductive materials. The workpiece produced by EDM is influenced by the materials' melting points, electrical resistance, and thermal conductivity. The tool is suitably submerged in a dielectric liquid, such as kerosene, deionized water, or any other appropriate fluid, as does the workpiece. This study offers a significant overview of several EDM operation types. The machining reactions and mathematical modeling are also briefly discussed.

**Keywords**
WEDM, Micro-EDM, Non-conductive ceramics, TWR, MRR

**ICIRIST-FLP-ABS-017**

# A STUDY ON THE BURNOUT LEVEL AMONG THE EMPLOYEES AT NEST CYBER CAMPUS-BANGALORE

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## ABSTRACT

Burn out is basically a stress induced problem prevalent among helping professionals like social-workers, nursing staff, employee-relations executives, teachers and law enforcing functionaries. People in helping profession like doctors, counselors, police officers and nurses also have greater probabilities of burnout (Maslach 1982). Burnout does not occur suddenly but begins with small warning signals and most of the time one can not pin point the exact cause. As said by Lee and Ashforth (1988) through their longitudinal study on supervisors and managers, burnouts develop on phases.

**ICIRIST-FLP-ABS-018**

# COMPACT SLOT ANTENNA FOR UWB APPLICATIONS

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**ABSTRACT**

In this paper, we propose a novel compact ellipse patch radiator and CPW (Coplanar Wave Guide) fed antenna for UWB applications. The proposed antenna has very compact size of 18×18 mm² is used for ultra wideband applications. The antenna substrate thickness IS 0.8mm. The proposed antenna consists of two symmetrical half slot antenna elements with coplanar waveguide – fed structures and y shaped slot that is cut at the bottom center of the common ground plane. The slot efficiently prevents the current from directly flowing between two ports at low UWB frequency. The antenna covers 1.6 to 14 GHz. This proposed antenna has been studied using Finite Element Method (FEM) numerical techniques. This proposed structure is a high directive gain, low-cost, low weight antenna. The characteristic analysis such as return loss (RL), VSWR and radiation pattern of this antenna has been investigated numerically. Numerical study has been carried out by using Ansoft HFSS V13 simulating software. The proposed antenna also contains relatively stable radiation pattern and gains.

**ICIRIST-FLP-ABS-019**

# PREDICTION OF CORONARY ARTERY HEART DISEASE USING MACHINE LEARNING TECHNIQUE

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**ABSTRACT**

Coronary artery heart disease (CAD) is caused by atherosclerosis in coronary arteries and results in cardiac arrest and heart attack. For diagnosis of CAD, angiography is used which is a costly time consuming and highly technical invasive method. Therefore, prompted for alternative methods such as machine learning algorithms that could use non-invasive clinical data for the heart disease diagnosis and assessing its severity. This can be contributed primarily to the improvement in the classification contributed primarily to the improvement in the classification and pinpointing systems used in disease identification which is able and recognition systems used in disease diagnosis which is able to provide data that aids medical experts in early identification of fatal diseases and therefore, raising the survival rate of patients importantly. The results of the study strengthen the concept of the applying of machine learning in early detection of diseases. A support vector machine and artificial neural network, trained with data set of spectra and algorithms, have been implemented for prediction of disease. Heart disease prediction using data mining is one of the most interesting and challenging tasks.

**ICIRIST-FLP-ABS-020**

# INTELLIGENT BATTERY MANAGEMENT SYSTEM FOR CHARGERS USED IN EV's

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**ABSTRACT**

The demand for electricity is rising in the country with an increase in population. To meet the peak load demands renewable energy sources like solar and wind can be used along with conventional sources. The power electronic converters inject harmonics into the system which leads to various power quality issues. So, in this research paper a new hybrid method is introduced for the enhancement of power quality in grid-connected PV systems, which is a combination of both the Adaptive Algorithm (AA) algorithm with Logic Controller (LC) - ALC. ALC is used to track the maximum power of the PV system. It offers high accuracy and good robustness. ALC provides accurate fast response, high performance and maximum efficiency. Therefore, the combination of these controllers together could improve the MPPT and PV performance. The proposed method reduced the THD compared with traditional Radial Basis Function Network (RBFN) and Incremental Conductance (IC)-MPPT (Maximum Power Point Tracking) techniques. The proposed method is executed in the MATLAB/Simulink platform to analyze the performance of power quality issues.

**ICIRIST-FLP-ABS-021**

# Preparation and Study of Zinc Oxide Nanoparticles (NP's) by Chemical Method

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**ABSTRACT**

Zinc Oxide nanoparticles (np's) were prepared over the dielectric substrate by chemical method which prepared by molar concentrations at various temperatures. The surface morphology and structure of the prepared nanoparticles were characterized by Scanning Electron Microscope (SEM) to confirm the presence of nanoparticles (np's), X-ray diffraction (XRD) were performed for finding size of the particles. The forbidden band gap of the nano materials was characterized by UV-Visible spectroscopy in which the value of 3.2eV. The electrical, optical and structural properties were studied.

**Keywords**

ZnO nano particles, electrical, optical and structural properties.

**ICIRIST-FLP-ABS-022**

# Study of Velocity and Compressibility of Ultrasonic Waves in different Liquid at Room Temperature

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**ABSTRACT**

Ultrasonics sound waves having frequency more than 20 KHz. The audible range of frequency of sound lies between 20 Hz to 20,000 Hz. Velocity of sound increases with temperature. In this paper detail study with velocity, density and compressibility of ultrasonic waves in different liquid (Methanol, Ethanol and propanol) at room temperature during month of November 2023 to December 2023 by using ultrasonic interferometer.

**Keywords**

Interferometer, ultrasonic, voltage, frequency.

**ICIRIST-FLP-ABS-023**

# A STUDY ON ONLINE CUSTOMER RELATIONSHIP MANAGEMENT PRACTICE TOWARDS CUSTOMERS' SATISFACTION IN SUPER MARKET-ARIYALUR

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**ABSTRACT**

Customer Relationship Management (CRM) is an enterprise-broad business strategy practice directed at attracting, retaining and effectively serving customers to grow up their state of values over the long term. Developing business is never end process and CRM is playing a vital role in success of the business. It is not an exemption. CRM is quite a new phenomenon in retailing industry. The purpose of the study is satisfaction level of customers of the respective super market and finally to determine the relationship between CRM practices adopted by the super market and loyalty of their customers. The study conducted Tiruchirappalli district with 200 respondents, and each 50 respondent from selected four super markers (FSM, Reliance, Kavery, Kumudham) stores. The study was descriptive in nature so questionnaire method was adopted. The result shows that, increasing CRM practices in retail industry will be have bright future with role in providing better quality services to understand which built customer satisfaction and fulfill their expectation.

**KeyWords**

CRM practices, Retail Industry, customer satisfaction.

**ICIRIST-FLP-ABS-024**

# Design of 2X2 rectangular microstrip patch antenna for WiMAX Hotspot coverage

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**ABSTRACT**

This study introduces on the rectangular patch antenna designs and performances using inset-fed feeding technique. Two antenna arrangements are presented with the first one is using basic rectangular patch while the second antenna is based on 2x2 array with corporate feeding arrangement. Both antennas are designed at 2.45 GHz, on microstrip substrate, type FR4 with dielectric constant,εr=4.3 and thickness of h = 0.3mm. The antennas are simulated using HFSS High-frequency structure software and fabricated to validate the work. The result shows that the performances match with models when evaluated in terms of return loss,gain,and directivity. It was found that the array antenna has successfully increased the gain 4 times higher and improved directivity compared to the single patch antennaThe antenna's design parameters, including its dimensions, substrate material, and feeding technique, are meticulously discussed to optimize its performance for WiMAX applications. Results indicate that the proposed antenna configuration offers enhanced performance metrics suitable for achieving robust WiMAX Hotspot coverage. The study underscores the importance of robust infrastructure and strategic positioning of WiMAX hotspots to meet the escalating demands of modern communication systems.

**Keywords**

Rectangular Microstrip patch antenna,HFSS high frequency structure simulator

# Research Project Presentations – I

**ICIRIST-ERP-001**

# Remote Controlled Cooling and Lighting System for The Aquarium

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## ABSTRACT

Fishkeeping is a wonderful pastime that offers many advantages, such as mood enhancement, stress relief, and even depression prevention. When purchasing an aquarium, it is crucial to monitor the water temperature to prevent fish in suffocating from the high oxygen demand caused by the increased activity spurred on by the warmer water. There are many methods for lowering the water's temperature [1], including using ice, chillers [2, 3] and room temperature reduction. But utilising a fan is the easiest and most economical option. This article proposes an aquarium lighting and cooling system that can be operated remotely. Since light also plays a little role in the rise in water temperature, the aquarium will have both a cooling fan and LED light control. The user will have control over the fan's speed, the LED strip's brightness, and, of course, whether to turn the fan and LED on or off. The detail block diagram of the design is shown in Fig.1, with four main parts: Remote Control, RF module, Converter and Device. In the remote control, frequency synthesizer will be used to generate 8 different frequencies for eight controlling modes (Fan Off, low, medium and high; Light Off, low, medium and high).For RF module, the transmitter will transmit the frequency modulated from the VCO of the frequency synthesizer and in receiver part, it will receive the modulated signal from the transmitter and fetch it to the converter section. The converter itself will consist of three sub-sections. The frequency demodulator is used to first demodulate the received frequency using a standard Phase-Locked Loop. Then, using the LM2907 IC, the frequency will be transformed to a voltage analogue signal. After the analogue signal was converted to a digital signal, an Arduino Nano was used to output the digital signal to the LED and fan. The signal would be 3 different brightness of the LED light strip and 3 different speeds of the fan with on-off for LED and fan. The suggested aquarium is a 5.5-gallon tank (16 x 8 x 10 inches) as shown in Fig.2.

## ICIRIST-ERP-002

# Smart Blender Cooker with Frequency Synthesizer

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## ABSTRACT

Given its many features and ability to streamline the cooking process, blender cookers [1, 2, 3] are expected to become the most beloved kitchen equipment among women worldwide. This work presented a frequency synthesizer that will generate frequencies of 20kHz, 40kHz, 80kHz, and 160kHz, and applied to control the smart blender, as shown in Fig. 1. The serial device that connects the frequency synthesiser and smart blender is the Atmega328p Arduino. It is programmed to activate functions at predetermined output frequencies, including activate the weighting scale function at 20kHz, chop function at 40kHz, stir function at 80kHz, and cook function at 160kHz. To optimise the application, the smart blender's Wi-Fi module will turn on wireless communication with a smartphone. The wireless system allowed the blender to be remotely control and monitor by the users from the smartphone without the need for them to be physically observed the process in the kitchen, while the cooking process in progress. The frequency synthesiser could be upgraded in the future to have more signals to control the additional features (different cooking functions, grinding functions, overturn detection, etc.), which would improve the system's implementation. Aside from that, adding voice-over output to each command would enhance the use of the smart blender and benefit those who are visually impaired. In the future, to lessen application negative aspects and increase target user base, a highly detailed, affordable, and high-quality application system must be taken into consideration.

**ICIRIST-ERP-003**

# Lighting Control System Adopting Frequency Synthesizer

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## ABSTRACT

Lighting control systems are essential for buildings as they may lower the demand and energy use by adjusting lighting schedule, intensity, or zoning [1, 2, 3]. This article proposed a room lighting control system adopting frequency synthesizer, as shown in Fig.1. The system has photo resistive sensors that can turn on the light when it is dark and cut it off when the environment is bright. This will not only help the user to control the lighting but also make their lives more convenient. The control modes of the light brightness are shown in Fig.2. On user's remote-control side, four level of light brightness can be tuned according to the frequencies generated from the frequency synthesizer (20kHz, 40kHz, 60kHz, 80kHz), send to the Arduino to be encoded and display the user's choice on the remote control's LCD screen. The encoded signals will pass to transceiver and send to the lighting system side to control the light level. Other than the manual switching with remote control, the lighting system may also trigger by photo resistor sensors in an automatic mode. Future extend can be adding more JK flip-flops at the frequency dividers part of the frequency synthesizer to generate more frequencies' options to perform more tasks such as changing the bulb colour or making the bulb blinking. Besides, Lutron Toggler Dimmer that offers 250 lighting levels can also be adopted, making the lighting beyond the current simple 4 levels of lamp brightness. It is also compatible with single-pole or 3-way wiring and fits into most standard wall plates. Using a more sophisticated components would give a better experience and can also ease up users in exploring their lighting system.

## ICIRIST-ERP-004

# Automotive Control System with Two-way Communication

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## ABSTRACT

This article presents an automotive control system with two-way communication, as shown in Fig. 1. It consists of two mechanism parts: remote-control mechanism and vehicle mechanism, with details of the system as shown in Fig. 2. The frequency synthesizer embedded in the remote control will generate four different frequencies that uses to control four different applications in the vehicle, i.e. the 8kHz signal is used to lock/unlock the car alarm system when button A is pressed, 16kHz signal is used to ignite/off engine when button B is pressed, 32kHz signal is used to open/close the car rear bonnet when button C is pressed, and the 64kHz is to turn On/Off the car air conditioner when button D is pressed. Arduino (ATmega328p) in the remote control will receive the input frequency signals, coded them, and passed them to the IR transmitter to transmit it wirelessly to the vehicle mechanism side. At the Vehicle mechanism side, the IR receiver will receive the signal, its Arduino will decode the signal and perform tasks accordingly (trigger car lock/engine/rear bonnet/air-cond.). Arduino at Vehicle mechanism side will later feedback a signal via its IR transmitter to the IR receiver of the remote-control mechanism to trigger its LED for user indication about successful task execution. In the future, the frequency synthesiser can be improved to generate more signals to manage more extra features (inner lamp On/Off, radio On/Off, car-seat adjusting, auto-parking, auto-driving etc.), that could improve the car driving experience. Apart from that, providing voice-over output for every command would improve its usability and help those visually impaired users.

**ICIRIST-ERP-005**

# Design of Frequency Synthesizer for FM Demodulation using Proteus

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## ABSTRACT

Using Proteus simulation software, a Phase-locked loop (PLL) is used to design the frequency synthesizer and demonstrated for FM demodulation, as shown in Fig. 1. The antenna will be able to receive the LF signal between 30Hz to 300kHz in the wavelengths range from 1m to 1km respectively. The signal will be amplified once it is received by the non-inverting operational amplifier. Next, it will go through the band pass filter to select specific frequencies between 178 Hz to 189 KHz. After that, the LED D1 will be turned on to indicate signals are passing through it. The frequency synthesizer will be used to extracts the original information-bearing signal from a carrier wave. It is used to recover the information content from the modulated carrier wave. The modulated signal is passed into pin 14 (SIG IN) of the 4046 PLL IC. Then phase comparator 1 in pin 2 (PC1out) is connected to pin 9 (VCOin) by using low pass filter. The VCO will regenerate the reproductive frequency and output at pin 4 (VCOout) to SW2 and CD4040B paths. When the SW2 switch is closed and SW3 switch is opened, the output from VCO will straight loop back to pin 3 (COMPIN). If the SW2 is opened and SW3 is closed, VCO output will passed to CD4040B pin 10 (CLK) and demodulate the message signal. The signal from different frequencies ranges can be receive by tuning the divider ratio (between divide by 2, divide by 4, divide by 8 or divide by 10). The output of frequency divider will pass back to CD4046 pin 3 (COMPIN) and demodulate message with certain frequencies for example like 20 KHz FM signal need to divide by 2 in CD4040B to demodulate the correct message. LED D2 will start to blink and pass received signals into 8043 once the VCO output signal pass through the LED D2 path. The VCO generated pulses will be converting into analog signals with DAC3AFPZ circuitry. The message signal will be amplified by LM675T before passing to display on the speaker.

## ICIRIST-ERP-006

# Wireless Control of Water Level in a Tank Using Ultrasonic Sensor and Frequency Synthesizer

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## ABSTRACT

In the world of electronics, frequency synthesisers are widely used and have numerous applications, particularly in the areas of wireless technologies and telecommunication. This article proposed a framework to detect dangerous/hazardous level of water in a tank by using ultrasonic sensor (HC-SR04) and to control the water level from a control room, as shown in Fig. 1. The RF-module, which operates at 433MHz for warning alert data transmission and 315MHz for reaction from the control room, be used in conjunction with two Arduino UNO Boards (equipped with ATMEGA328). Three signal modes produced by the frequency synthesiser: 2 MHz signal for the buzzer and water tank reception, 4 MHz signal for the LCD display the "UNSAFE WATER LEVEL", and 8 MHz signal for the LED blinked and the data transmitted to the water tank and automatically the valve opened to flow out the water until it reaches the safe level. will be used in the control room to help the person there identify the exact nature of the issues. Limitation face in the development and solution obtained: 1) choosing the right antenna for the RF module- stranded is better as it will not easily breaks as like a solid antenna type; coated typed antenna was believed to be better as bare type is not safe and it's prone to electromagnetic wave interference from any other outside source; right thickness for antenna- gauge 18 (1.024mm) or gauge 16 (1.292mm) for longer range transmission. 2) Maximizing the transmitter power for maximize distance - increasing the voltage supplied to the transmitter from 5V to 12V, managed to get roughly 100m between transmitter and receiver.

**ICIRIST-ERP-007**

# AI-Optimized Eco Drip: Precision Irrigation for Sustainable Agriculture

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## ABSTRACT

In an era marked by growing concerns about water scarcity and environmental sustainability, this project introduces an advanced AI-controlled valve system integrated with weather data, plant disease detection, and machine learning algorithms for optimal water management in an eco-friendly automated drip irrigation setup. The system, meticulously designed for the cultivation of vital vegetable crops such as tomatoes and potatoes, leverages renewable technology and cutting-edge practices to revolutionize agricultural water management. Various machine learning algorithms, including K-nearest neighbour (KNN), support vector machine (SVM), decision trees (DT), and random forest (RF), are strategically employed to optimize irrigation volume, timing, scheduling, soil moisture prediction, and weather predictions.

Real-time weather data integration enables adaptive watering schedules, further optimizing water usage based on current environmental conditions. The addition of AI-driven surveillance cameras for plant disease detection empowers farmers with proactive monitoring, allowing timely identification and intervention. In contrast to traditional irrigation practices, which often suffer from inefficiencies and water wastage, the AI-controlled valve system presented in this project offers a significant advantage. Traditional methods may rely on fixed schedules, manual monitoring, and lack adaptive capabilities, leading to over-irrigation, water runoff, and increased susceptibility to diseases. The models implemented here provide a dynamic and data-driven approach, mitigating these disadvantages by precisely tailoring irrigation decisions based on real-time conditions. This ensures optimal water usage, reduces environmental impact, and promotes sustainable farming practices, marking a substantial improvement over conventional irrigation methods.

## Keyword

AI-controlled valve system, Sustainable agriculture, Drip irrigation, Water management, Machine learning algorithms

**ICIRIST-IRP-008**

# FUZZY LOGIC-POWERED LOAD BALANCING FOR CLOUD COMPUTING SERVICES

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## ABSTRACT

Cloud computing and artificial intelligence have made significant strides in today's environment. Networks for artificial intelligence and computation have grown because of their shared use in many spheres of life. Numerous difficulties and problems, such as security and computer performance, must be dealt with simultaneously. The purpose of this study is to use fuzzy logic to measure cloud computing load and enhance the service model. A lot of research has been done to find out how to combine artificial intelligence and cloud computing. From earlier research and literature, a variety of designs, models, and algorithms have been examined and noted. Virtualization, internet access, software, and online services are all included in cloud computing. Optimizing the benefits and satisfy customer service quality standards, the cloud provider must arrange jobs. Because of the overgrowth of the cloud, service providers are faced with tremendous expectations. The main issues are service availability and workload performance. The work required to process numerous queries at once has grown. This study balances the cloud load using MATLAB and fuzzy logic. To maximize processing time and storage utilization, fuzzy logic balances the load on cloud computing by utilizing the Virtual Machine's (VM) processor speed, storage capacity, and allocated load.

## Keywords

Cloud Computing, Fuzzy Logic System, Load Balancing, Service Model, Virtual Machine.

**ICIRIST-ERP-009**

# Unveiling Educational Disparities: A Multifaceted Analysis of Dropout Rates AcrossSchools, Regions, Genders, Castes, and Age Groups to Inform Precision Policy Interventions in Pursuit of Inclusive Education

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## ABSTRACT

Education stands as the linchpin for societal progress, with global governments entrusted to ensure universal access and continuous enrolment. The pervasive challenge of high dropout rates within schools is deeply rooted in the intricate interplay of socioeconomic, cultural, and institutional dynamics. This abstract underscores the pivotal significance of dissecting dropout rates across various dimensions to inform precise policy interventions, encompassing school-wise, area-wise, gender-wise, caste-wise, and age/standard-wise perspectives.In the realm of school-wise analysis, scrutiny of dropout rates unveils critical disparities pivotal for educational reform. Identifying institutions grappling with persistently elevated dropout rates initiates an investigative process targeting core issues such as infrastructural deficiencies, teaching quality, and the overall school environment. Tailored interventions, including teacher training, infrastructure development, and community engagement, can be meticulously crafted to address the unique challenges faced by these identified schools. Formulating affirmative action policies becomes imperative to ensure equitable opportunities for students from marginalized castes.

Concurrently, strategic awareness campaigns aimed at dispelling social stigmas associated with specific castes play a pivotal role in fostering inclusivity within the educational landscape.Exploring age/standard-wise dynamics identifies specific junctures at which students are more susceptible to dropout. The resultant findings equip policymakers with the requisite knowledge to implement measures strategically addressing the root causes of dropout rates, fostering a more inclusive and equitable educational system.

**Keyword**

Education Dropout Rates, Policy Interventions, Socioeconomic Disparities, Data Science in Education

**ICIRIST-ERP-010**

# PRODUCTION OF POLYHYDROXYBUTYRATE FROM AN ISOLATED NOVEL BACTERIA FROM SOIL

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## ABSTRACT

Polyhydroxybutyrates (PHBs) garnered considerable attention as a biodegradable plastic, and are the stockpile material found in numerous bacteria. These materials serve as a commendable substitute for conventional polymers, primarily owing to their rapid disintegration in natural surroundings. This study was conducted with the objective of identifying, isolating, and evaluating potential PHB-producing bacteria from oil-spilled soil samples. A total of 108 colonies were obtained through serial dilution and culturing. Different screening techniques, including Sudan black B, Nile red, and Nile blue staining were utilized resulting in the isolation of four positive strains: SNA1, SNA2, SNA3, and SNA4. Among these, SNA2 exhibited the highest production of PHB, accounting for 68% of PHB from dry cell weight. The polymer produced by SNA2 was confirmed as PHB through FTIR and 1H NMR analysis, after extraction and quantification was done using sodium hypochlorite method. Furthermore, 16S rRNA sequencing identified strain SNA2 as *Klebsiella pneumonia*. Optimization studies were conducted by taking five key factors into consideration: carbon source, nitrogen source, temperature, pH, and incubation period. Xylose (10%) and urea (2%) were found to be the most efficient sources of carbon and nitrogen respectively yielding the highest PHB production of 74%. The best conditions were determined to be a pH value of 7.5 at 35 °C with an incubation time of 36 to 48 hours.

**Keywords**

Polyhydroxybutyrates (PHBs), Biodegradable plastic, FTIR analysis, 1H NMR analysis, *Klebsiella pneumonia*, Sodium hypochlorite

**ICIRIST-ERP-011**

# Process development for the enhanced vitamin B12 production from a novel microorganism

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## ABSTRACT

Vitamin $B_{12}$ ($B_{12}$) is a cofactor for many important enzymes in the synthesis of DNA, fatty acids and myelin in human. $B_{12}$ deficiency is the cause for pernicious anemia and distributed among all age groups of world population. In India, $B_{12}$ deficiency is prevalent over 50% of total population. As animal meat is the major source of $B_{12}$, the deficiency among Indians is high due to religious beliefs and affordability. Hence, it is inevitable to develop an alternative technology to produce $B_{12}$ to overcome the mentioned challenges. This study aims to develop a strategy for cost-effective production of $B_{12}$ from novel microorganisms. *Pseudomonas sp.*, being an industrially recognized natural $B_{12}$ producers was chosen as the potential screening target for the microbial production. The samples were collected from soil sources near algal growth enriched lake and different assay methods were used to identify and screen the targeted organisms. The ability of the isolated strains to synthesize $B_{12}$ was found by the bioassay using mutant Salmonella typhimurium auxotroph. So far, a total of 27 strains have been found positive for *S. typhimurium* assay. Among these two strains were found to be high $B_{12}$ producers and 16s rRNA characterization revealed them as *Pseudomonas otitidis* and *Bacillus cereus* respectively. Media optimization and screening of cheaper carbon sources such as wheat bran, corn steep liquor and Beet molasses further would lead for cost effective production of vitamin $B_{12}$ using the isolated strains.

**Keywords**

Vitamin B12, Microorganism, Fermentation, Bioassay

**ICIRIST-ERP-012**

# Biomass Conversion of green seaweed into fermentable sugars

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## ABSTRACT

The production of biofuels and industrially important biochemicals from diverse biomass has been extensively studied in the past few decades. Recently, the development of various value-added products from marine macroalgae (seaweed) has attracted many researchers due to its macromolecule richness and no lignin composition, providing a new platform for biomass-based biorefineries. However, very few reports were found for the biochemical production by bacterial fermentation using seaweed biomass as a substrate. In this study, we used a green seaweed, which was pretreated using acid thermal hydrolysis by varying the biomass concentration (5–15% w/v), varying acids ($H_2SO_4$, HCl & $H_3PO_4$ ) with acid concentration (100–600 mM) and thermal hydrolysis time (min) with 121 °C temperature and 15 psi pressure as constants. 18.59 g/L reducing sugars was obtained with 10% biomass, 500 mM HCl and 60 min TH time. Whereas, $H_2SO_4$-pretreated biomass yielded 18.5 g/L of reducing sugars with 10% biomass, 300 mM $H_2SO_4$, and 75 min TH time. Meanwhile, thermal hydrolysis process for $H_3PO_4$ pretreated biomass and the highest reducing sugar yield with best TH conditions will be validated further.

**Keywords**

Acid Thermal Hydrolysis, seaweed, biorefinery

**ICIRIST-ERP-013**

# Effects of Seaweed Extract on Crocus sativus in In-house Cultivation using Vertical Farming

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## ABSTRACT

Saffron is one of the costliest spices in the world. It is derived from the dried stigmas of the *Crocus sativus* flower. The cultivation and harvesting of saffron strands is a very complex and tedious process. The cultivation of saffron requires a huge landmass and is laborious. As an attempt to reduce the complexity associated with traditional method, we have employed indoor cultivation technique along with vertical farming to minimize the land area requirement. Our research targets on enhancing the growth parameters of the plant such as sprouting of corm, flowering period and shoot length. This was attained by pre-treating the corms using seaweed extracts of *Sargassum wightii* and *Kappaphycus alverzii,* which are rich in various macronutrients, micronutrients, and organic substances, including sterols, amino acids, growth hormones, and vitamins, making them a sustainable alternative to conventional fertilisers. The saffron corms (seeds of *Crocus sativus)* were pretreated with the seaweed extracts by soaking them for a particular time period prior to sowing. The treated plants showed better results such as increased plant height, early sprouting and flowering of corms compared to the plants cultivated without treatment. Overall, incorporating seaweed extract into the cultivation practices of Crocus sativus has proven to be a beneficial approach for growth also has long-term positive effects on the soil quality and sustainability of the cultivation system.

## Keywords

Saffron, In-house cultivation, Seaweed extract, Biostimulant, Vertical farming, Growth enhancement.

**ICIRIST-ERP-014**

# AUTOMATIC DETECTION OF EYE TUMOUR USING CNN APPROACH

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**ABSTRACT**

Eye tumour is a rare disease but according to malignancy, it is the most common type of cancer. Just like other types of cancers, it is curable for most of the cases if diagnosed properly but the process of diagnosis is quite challenging and is the most problematic issue in the treatment of eye melanoma. This paper presents an automated eye melanoma detection method using a convolutional neural network (CNN). 170 pre-diagnosed samples are taken from a standard database followed by pre-processing to lower resolution samples and finally fed to the CNN architecture. The proposed work eliminates separate feature extraction as well as the classification for the detection of eye melanoma. Although the proposed method requires a huge computation, a high accuracy rate of 91.76% is achieved outperforming the eye tumour detection using an convolutional neural network(CNN).

**Key words**

CNN, MELANOMA,TUMOUR

**ICIRIST-ERP-015**

# Biodegradable microcellulose Packaging Film incorporated with ZnO and lignin for enhanced antimicrobial, antioxidant and UV absorption properties

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## ABSTRACT

Food packaging films are an essential part of daily life and have been an important topic of discussion, most of the films are mostly composed of plastic or petroleum derived compounds which has a harmful effect on the stored items as well on the environment. Studies were conducted to make films which are biodegradable but when cut foods are to be packed we prefer plastic packaging as it can keep the food fresh for longer period. Naturally occurring or synthetically derived biopolymers that are biodegradable make good packing films. Rice husk is a rich source of cellulose which is extracted by an enzymatic process using laccase. Laccase is an enzyme normally produced using microorganisms but in my work it is extracted from *Leucaena leucocephala* leaves. Laccase initiates the degradation of lignin and enables clean synthesis of cellulose. The cellulose is combined with lignin at different percentages to produce a film which is checked for their UV absorption property. Lignin is a phenolic biopolymer found in woody plants that protects the cellulose from harmful Ultraviolet radiation. The film is incorporated with ZnO nanoparticles synthesized from *Citrus limetta* leaves to increase the antioxidant and mechanical stability of the packaging film. The described methods provide a good method to produce cellulose films with enhanced anti-microbial, anti-oxidant and UV blocking properties.

**Keywords**

Laccase, Zinc oxide nanopartivcles, anti-microbial, anti-oxidant, UV absorption, Ultra violet radiation, packaging film

**ICIRIST-ERP-016**

# Synthesis of activated Magnetic Biochar from Citrus fruit peel waste as Heterogenous Catalyst for Biodiesel Production

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## ABSTRACT

Biochar catalysts are organic charcoal used to enhance chemical reactions, improving efficiency in various applications like environmental remediation, agricultural practices and energy production. They improve soil fertility, carbon capture and biofuel production contributing to sustainable practices and converting biomass into energy sources. Biodiesel production converts renewable feedstocks like vegetable oils or animal fats into a sustainable alternative to traditional diesel fuel. Transesterification is the key process, involving triglycerides reacting with alcohol to form biodiesel. This environmentally friendly method reduces greenhouse gas emissions and promotes a sustainable energy future. In the present investigation. The biochar catalyst was synthesized from food waste material of *citrus limetta*. The mixed algal and castor oil was mixed used for biodiesel production using the synthesized activated magnetic biochar biochar catalyst. The synthesized activated magnetic biochar was subjected to characterization using SEM, FT-IR, XRD, TGA-DSC and BET analysis. The optimization process was studied through response surface methodology and factors such as methanol to oil ratio, temperature, catalyst concentration, time were optimized for obtaining the highest yield of biodiesel.

**Keywords**

Algal oil, Castor oil, *Citrus limetta*, Transesterification, Characterization.

**ICIRIST-ERP-017**

# Contemporary advancements of cryopreservation techniques in the domain of biomedical applications: A review

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**ABSTRACT**

Cryogenic technology has revolutionized the landscape of biomedical engineering, offering innovative solutions across a multitude of applications. Cryogenics, as a fundamental principle, has found a vital role in the preservation of biological materials. The fields of cryopreservation have been advanced since the 50th year of 20th century. During cryopreservation the cell's metabolism, which causes damage to biological material is stopped effectively. Cryopreservation techniques have enabled the long-term storage of cells, tissues, and organs, with the potential to extend the viability of transplantable organs and the cryopreservation of vital stem cell populations. This comprehensive review article examines the wide-ranging advancements of cryopreservation techniques with associated challenges, and the promising prospects which include cryopreservation techniques of composite tissues, cells and various improving cryopreservation systems. This article enlists the backlogs in field of cryopreservation and gives an initiation to cryosurgery and its application. This article also reviews some of the existing literature on cryopreservation techniques and explains the challenges, gaps, correlation and the future direction in which the advancement of cryopreservation could proceed.

**Keywords**

Cryogenics, cryopreservation, transplantable organs, cryosurgery, Composite tissues.

**ICIRIST-ERP-018**

# A review on implantation and analysis of E-Tattoo sensor in human interfaces

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**ABSTRACT**

Electronic tattoos, colloquially known as e-tattoos, mark a paradigm shift in human-computer interaction. These tattoos, functioning as innovative interfaces, embed sensors and electronic components directly onto the skin. Offering discretion and comfort, they monitor physiological parameters, from vital signs to muscle movements and brain activity. This technology facilitates diverse applications, including health monitoring and gesture-based interactions, forging a more intuitive connection between humans and devices.

Despite their potential, challenges such as power supply, durability, and biocompatibility must be addressed for widespread adoption. Ongoing research endeavors seek to refine electronic tattoos, ensuring they become integral components of daily life. This review explores existing literature on e-tattoo sensing, examining methods, challenges, and future directions. It serves as a concise guide for advancements in this evolving human-computer interaction field.

**Keywords**

E Tatoo, human system interface, Biocompactibility, Gesture based interaction.

**ICIRIST-ERP-019**

# BIOCHEMICAL PROFILING OF Saccharum spontaneum: A COMPREHENSIVE REVIEW ON PHYTOCHEMICAL COMPOSITION, ANTIOXIDANT CAPACITIES, AND THERAPEUTIC APPLICATIONS

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## ABSTRACT

Saccharum spontaneum, commonly known as wild sugarcane, has a long-standing history in traditional medicine, holds profound significance in various Hindu rituals, playing a central role in religious and cultural practices and also exhibits various multifaceted biological activities for potential therapeutic applications. This multidisciplinary examination encompassed phytochemical analysis, uncovering the presence of alkaloids, flavonoids, and terpenoids across various plant parts. Notably, the antioxidant properties of Saccharum spontaneum extracts were explored, demonstrating promise in mitigating oxidative stress. In vitro studies systematically assessed its antimicrobial efficacy against diverse pathogens, establishing its role as a potent source of antimicrobial agents. Additionally, anti-inflammatory potential was elucidated through cytokine production assays and inhibition of key inflammatory markers. The review delved into the cytotoxic effects of Saccharum spontaneum extracts on cancer cell lines, offering valuable insights into its potential role in oncological research and drug development. Preliminary investigations into its impact on diabetes-related parameters added another layer of significance, suggesting a potential role in managing metabolic disorders. This review also elaborates the scientific reasons of using Saccharum spontaneum in various rituals and also contributes to the current understanding of Saccharum spontaneum's biological activities, providing a robust foundation for further research and the development of innovative therapeutic agents. The diverse array of bioactive compounds within Saccharum spontaneum positions it as a promising candidate for addressing various health challenges in pharmaceutical and nutraceutical domains.

## Keywords

Saccharum spontaneum, Phytochemicals, Biological activities, Religious rituals, Therapeutic applications.

**ICIRIST-ERP-020**

# PYRIDINE DERIVATIVE SILVER NANOPARTICLES: SYNTHESIS, CHARACTERIZATION AND IN VITRO ASSESSMENT OF ANTIMICROBIAL ACTIVITY

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**ABSTRACT**

Silver nanoparticles (AgNPs) have found extensive applications in cotton fabrics, cosmetics, food packaging, agricultural products and biomedical applications such as wound dressings, dental materials, bone implants, tissue engineering, drug delivery carrier, coated medical equipment and so forth. These nanoparticles possess unique antimicrobial properties, making them a promising alternative to antibiotics in combating bacterial pathogens. Consequently, this study aimed to synthesize silver nanoparticles conjugated with pyridine derivatives and investigate their characterization and antimicrobial potential. To determine the formation and stability of pyridine-coated silver nanoparticles, UV-vis spectroscopy analysis was conducted. The morphological appearance of these nanoparticles was revealed through SEM analysis, which demonstrated their spherical shape. Additionally, FTIR analysis was employed to observe the functional groups present in the synthesized pyridine-coated silver nanoparticles. The average size of the synthesized nanoparticles was analyzed using DLS measurement. Furthermore, the primary objective of this study was to assess the antimicrobial potential of pyridine-coated silver nanoparticles against both gram-positive and gram-negative bacteria using the disc diffusion method. In summary, this study focused on synthesizing and characterizing silver nanoparticles conjugated with pyridine derivatives. The antimicrobial potential of these nanoparticles was investigated, providing valuable insights into their potential applications in combating bacterial pathogens.

**Keywords**

Pyridine, Silver nanoparticles, Chemical synthesis, Antibacterial activity

**ICIRIST-ERP-021**

# AI-Driven Smart Helmet 5.0

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## Abstract

To enhance worker security and contribute to advancements in occupational health and safety, the Smart Helmet 5.0 has been innovatively designed. This cutting-edge helmet not only monitors environmental conditions but also conducts near real-time risk assessments. The collected data from various sensors, including temperature, humidity, and gas sensors, as well as touch sensors between the helmet and the user's head, is seamlessly transmitted to an AI-driven platform for thorough analysis. By constantly monitoring air quality and luminosity, the Smart Helmet adjusts its axes dynamically, ensuring a swift response to potential accidents within a work team

**Keywords**

Smart Helmet, Temperature sensor, Humidity sensor, Gas sensor

**ICIRIST-ERP-022**

# Formulation and evaluation of Basil Oil Nano emulsion Loaded Hydrogel

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## ABSTRACT

The ongoing strategy to mitigate microbial infections involves the pathogenic suppression of infectious agents. In alignment with this objective, we have formulate and characterized hydrogel loaded with a nanoemulsion of basil oil. This formulation is designed to effectively counteract microbial pathogenicity while augmenting its antimicrobial efficacy. Basil oil was extracted from Ocimum basilicum using the hydrodistillation extraction method. Furthermore, a bioactive compound of extracted basil oil was identified using GC-MS. Basil oil nanoemulsion (BON) was developed using the ultrasonic emulsification method by incorporating basil oil, Tween 80, and water. Later, the formulated nanoemulsions were grafted with the Guar gum-based hydrogel matrix. The BON was evaluated for globule size, zeta potential, FTIR analysis, and surface texture by SEM. A study was conducted to analyze antimicrobial sensitivity, the minimum inhibitory concentration, anti-biofilm potential, and membrane integrity for gram-positive, gram-negative bacterial and fungal strains. The BNE formed with minimum droplet dimensions of 28.3 nm with a zeta-potential of −31mV showed much more kinetic stability. The developed basil oil nanoemulsion hydrogels (BONHs) showed enhanced antibacterial activity against Escherichia coli and Staphylococcus aureus with their ability to impair the consistency of the cell membrane. In addition, the BONH reported a twofold increase in antibiofilm activity than BON. The findings demonstrate the possibility of using BNE and BNEH against different microbial pathogens such as potential antimicrobial and antibiofilm agents.

## Keywords

Anti-biofilm potential; Basil oil Nanoemulsion; Guar gum; Hydrogel.

**ICIRIST-ERP-023**

# Analysis of Corticomuscular Coherence Between Cortical and Facial Muscle Activities

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## ABSTRACT

*The most frequent human behavior is emotional, and this is where it is crucial to assess the functional relationship between the motor cortexand the muscles of the face. By comparing the coherence of the concurrently recorded electroencephalography (EEG) and electromyography (EMG) activities, this corticomuscular control is typically identified. The EEG-EMG coherence has been attempted to be estimated in this work utilizing magnitude squared coherence (MSC) functions. The concurrent EEG-EMG activity of 32 healthy volunteers was used for this purpose as they watched films in various emotional states. The magnitude squared coherence function is applied to the facial EMG signal of the zygomaticus major muscle and the EEG signal connected to the motor cortex region. Additionally, the connection between EMG signals and the alpha (8-13 Hz) and beta (14-29 Hz) spectral components of traditional EEG frequency bands is also examined. The findings demonstrate a considerable electrical coherence between the brain and the facial muscles in a range of emotional states. The frequency band interactions are also discovered to differ for various emotional states. The analysis appears to be able to be expanded to include the development of corticomuscular function in patients with neurological disorders.*

## Keywords

EEG, EMG, Corticomuscular Coherence, Magnitude Squared Coherence

**ICIRIST-ERP-024**

# Preparation and characterization of microencapsulated anti-microbial insock/footbed for foot comfort

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## ABSTRACT

The purpose of this model is to prepare an antimicrobial footwear insock to control foot infections. The available antimicrobial insock materials are are based on synthetic polymeric antimicrobial agents. The impact on health and environment have not explored yet. Nevertheless, use of natural antimicrobial agents for the preparation of footwear insock is an approach and the resultant product may have biodegrdable property and may protect the environment during disposal. In the present study, the antimicrobial property exhibited by the essential oils has been employed for the preparation of antimicrobial in sock materials. The product formulation based on microencapsulation of the oils is attempted and tested for the antimicrobial properties. Identified stabilizers in the form of melamine-formaldehyde resin increases the durability of the antimicrobial effect in footwear materials. The prepared materials subjected to various instrumental and biological analyses to ensure the incorporation of antimicrobial compounds in the in sock materials. In addition, in vitro and wearing tests has been carried out. The resultant product will be a value added product and find application in footwear manufacturing industries and satisfy the aatmanirbharbhaart in footwear sector.

## Keywords

Antimicrobial, microencapsulation, footwear

**ICIRIST-ERP-025**

# Synthesis of Zinc Oxide Nanoparticles Conjugated with the flavanoid for enhanced anti-inflammatory, anti-microbial and wound healing properties

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## ABSTRACT

The high-cost and limitations of current wound healing treatments have led to the search for alternative approaches or drugs, particularly from medicinal plants. The flavanoid Callophyllolide has proved to have good anti-inflammatory and wound healing properties. Nanoparticles hav the ability to cover a larger surface area and normally hold various enhanced properties thus nanomedicine is applied for many major and minor diseases. My work is to extract the flavonoids from Callophylum inophylum and combine it with the ZnO Nps' synthesised from Bryonia laciniosa. Antimicrobial properties of the synthesized ZnO NPs conjugated with flavonoids were assessed against a panel of pathogenic microorganisms, including bacteria and fungi, the antimicrobial efficacy was evaluated. The synergistic action of ZnO NPs and flavonoids in anti-inflammatory, anti-microbial and wound healing were studied and compared with the results obtained from them induvidually. This is then applied with suitable additives to ensuring their biocompatibility for future biomedical applications.

## Keywords

Zinc oxide nanoparticles (ZnO NPs'), Flavonoids, Bryonia laciniosa, Antimicrobial properties, Green synthesis, Biocompatibility.

**ICIRIST-ERP-026**

# Improved production of 3-hydroxypropionic acid with reduced by-product formation using genetically engineered Escherichia coli as a complete cell biocatalyst.

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## ABSTRACT

3-Hydroxypropionic acid (3-HP) is a highly valuable platform chemical in global demand, primarily due to its sustainability and eco-friendly characteristics. The biosynthesis of 3-HP has garnered substantial attention for its environmental advantages. However, a significant challenge in the biological production of 3-HP is the unwanted accumulation of by-products, which greatly impacts both the quantity and efficiency of 3-HP production. This study is dedicated to exploring metabolic engineering in Escherichia coli to address these challenges. mRNA expression studies identified yqhD, poxB, and pta-ackA as the primary targets for intervention. The deletion of these genes led to notable alterations in the synthesis of 3-HP and other major metabolites, including propanediol and acetate. Specifically, the deletion of yqhD resulted in a significant reduction in propanediol production, diverting carbon flux towards 3-HP. Furthermore, the simultaneous deletion of poxB and pta-ackA significantly reduced acetate concentration.Enhanced 3-HP production was achieved through the combinatorial deletion of yqhD, poxB, and pta-ackA, resulting in improved titers (556 mM vs. 440 mM) and yields (0.40 vs. 0.31). This work represents a promising approach to enhance 3-HP production while concurrently reducing by-product accumulation, making it a valuable tool for future applications.

## Keywords

Metabolite · 3-hydroxypropionic acid · Accumulation · Deletion · Pyruvate · Propanediol

**ICIRIST-ERP-027**

# POLYMERIC NANOCOMPOSITES FOR THE REMOVAL OF POLLUTANTS FROM WASTEWATER

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## ABSTRACT

The untreated water consists of contaminants and pollutants which cannot be eradicated easily through normal methods. The various methodologies were analyzed to remove these contaminants from the water as they cause serious effects on human beings and other sources. One such method is the Nanocomposites which are efficient in the removal of persistent pollutants. The Hybridization of nanomaterials with metal oxides and polymers suggested being productive. Polymer Nanocomposites have diverse applications in the removal of not only Persistent pollutants but also for the removal of heavy metal ions, dyes, and other potential contaminants. In this paper, a review of various Nanocomposites with their advantages and disadvantages was analyzed. It was found to be zinc oxide and $TiO_2$ was found to be promising metal oxide and styrene-based polymers seem to be efficient. The properties of various hybrid materials were analyzed for photocatalytic degradation, ultraviolet radiation, etc. Nanocomposites incorporated with metal oxides extensively employed in wastewater treatment to acquire enhanced quality and overcome any possible setbacks in achieving maximum removal can be done.

**Keywords**

Zinc oxide, $TiO_2$, Nanomaterials, Polymer Nanocomposites

**ICIRIST-ERP-028**

# COMPARATIVE STUDY OF ADVANCED OXIDATION TREATMENT OF TANNERY EFFLUENT IN HYBRIDIZED MUTLIORIFICE OSCILLATORY BAFFLED COLUMN

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## ABSTRACT

Tannery effluent is acknowledged as one of the significant pollutants causing contamination of water bodies and ground water in many nations. Technology for effective treatment of tannery effluent is still under incubation. The presented work is an attempt to hybridize advanced oxidation process with ultrasonic treatment. The advanced oxidation using ozone, fenton reagent and ultrasound was carried out using a Multi-orifice oscillatory baffled column, which intensifies the reaction between the effluent and oxidizers. Studies have been carried out to understand the effect of oscillation frequency upon treatment of tannery effluent using advanced oxidation. The results obtained indicate improved reduction of COD, BOD and TDS more than 90%. Thus the introduction of a MOBC and hybridization of the treatment with ultrasound can be a breakthrough in effluent treatment technologies.

**Keywords**

Multi-orifice baffled column, Ozone, Ultrasound, Fenton's Reagent, COD, BOD, TDS

**ICIRIST-ERP-029**

# Investigation of molasses treatment plant heat exchanger scale formation and scale formation reduction optimization: The case of the sugar factory ethanol plant

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## ABSTRACT

Industrial heat exchanger fouling has financial repercussions. Investigations were conducted on the scale deposit, including inorganic and organic compounds or ions that were obtained from the heat transfer units of the ethanol plant at the sugar industry. According to physical observation, the scale on the heat exchanger surface is the outcome of crystallization. For the molasses preheater, molasses heater, reboilers, and distillation column, respectively, the scales were firm and had an average thickness of 1.46 ± 0.17 cm, 1.86 ± 0.14 cm, 2.24 ± 0.18 cm and 2.40 ± 0.22 cm. This demonstrates that precipitation fouling is the kind of fouling that develops within the plant. In this regard, calcium oxide (CaO), among the scale-forming substances, was also shown to be the main scale-forming constituent by AAS, XRF, and XRD investigations. As a result, the investigation conducted in this work exhibited that modified thermal, and chemical, and acidic centrifugation treatments of molasses are preferred and recommended as compared to the existing molasses treatment method used in the FSF ethanol plant. The modified thermal and chemical treatment experimental analysis achieved 57.87 ± 0.78 wt. % of CaO removal efficiency with 1.04 wt. % CaO content in molasses, and it was low as compared to the 1.5 wt. % acceptable level of CaO content in molasses at the optimum process conditions of 100 $^{o}$C, 4 pH and 50$^{o}$ brix. However, at the optimum process conditions of 100 $^{o}$C, 4 pH, and 50$^{o}$ Brix, the existing treatment process CaO removal efficiency was around 32.14 wt.% with 1.52 wt.% CaO content in molasses. It was above the acceptable level of CaO content in molasses of 1.5 wt.%. Acidic centrifugation treatment was also recommended for the further removal of CaO and other scale-forming components.

## Keywords

Molasses; fouling; crystallization; heat exchanger; thermal, chemical, distillation; acidic centrifugation

**ICIRIST-ERP-030**

# "Innovative Approaches for Sustainable Wastewater Treatment in the Leather Industry: A Chemical Engineering Perspective"

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## ABSTRACT

Our project focuses on mitigating environmental concerns associated with the leather industry by developing an innovative method for the removal of chrome from industrial waste. The leather production process traditionally involves the use of chromium salts, leading to the generation of chromium-laden waste that poses ecological challenges. Our research aims to address this issue through an efficient and environmentally friendly approach to reduce the impact of leather industry waste. Waste Characterization: Conduct a thorough analysis of leather industry waste to understand the composition and concentration of chromium compounds, identifying the most prevalent forms of chromium and their potential environmental impact. Technological Innovation: Explore and develop advanced techniques for the effective removal of chromium from leather waste. This may involve the use of novel adsorbents, chemical treatments, or bioremediation methods. Regulatory Compliance: Ensure that the proposed solution complies with existing environmental regulations and standards. Develop guidelines and recommendations for the adoption of the chromium removal process within the leather industry. Through achieving these objectives, our project aims to provide the leather industry with a sustainable and responsible solution for managing chromium-containing waste, contributing to cleaner production practices and fostering environmental stewardship within the leather manufacturing sector.

**ICIRIST-ERP-031**

# Green Synthesis and Characterization of Ag and Ag/Fe3o4 Nanocomposites for Antimicrobial Effect and Rhodamine- B dye degradation

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## ABSTRACT

We have designed and synthesized magnetically separable catalyst (MSC) Ag/Fe 3 O 4 via facile two stage tactic whereas separately synthesized Fe 3 O 4 and Jatropha curcas root functionalized Ag nanoparticles (NPs) were combined at room temperature. The phase composition of Ag/Fe 3 O 4 NCs was revealed by morphological and structural assessment. Because once compared to Gram-positive Bacillus substilis as determined by the agar well diffusion method, the derived Ag/Fe 3 O 4 Nanocomposites demonstrated outstanding antimicrobial activity against Gram-negative Pseudomonas aeruginosa. This is due to positively charged surface of metal oxide NPs may bind to cell membrane. Interestingly, Ag-Fe 3 O 4 NCs demonstrated good photocatalytic activity for organic dye degradation. The photoelectron could perhaps ultimately collide only with dissolved solids in the substrate to form superoxides, which can damage the dye Notably, the reusability was tested using magnetic detachment without sacrificing photocatalytic efficiency. This finding represents a significant breakthrough in the fields of treatment of wastewater and biomedicine.

Keywords:
Ag/$Fe_3O_4$ NCs, JC-root, Green approach, Rhodamine B dye, reusability

**ICIRIST-ERP-032**

# DESIGN AND ANALYSIS OF CONVERSION OF SALT WATER TO POTABLE WATER SYSTEM

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## ABSTRACT

The conversion of saltwater (from oceans or seas) into potable (drinkable) water is a critical process, especially in regions facing water scarcity. Desalination, the method used to remove salt and other impurities from seawater, involves several techniques, with the most common being thermal distillation and membrane-based processes like reverse osmosis. Experimental investigations often aim to optimize key parameters such as energy consumption, water recovery rates, membrane durability, and cost-effectiveness. This paper aims to convert salt water into drinking by applying the sequential techniques such as coagulation, sedimentation and filtration. In the coagulatiuon a coagulant called alum aluminumsulpfahte is applied . and in the filtration process reverse osmosis techniques havs been engaged in the conversion of salt water into drinking water .The sea water is fetched from kattumavadi area of pudukkottai district . This waster was analysed for its composition . Further the dimensions of all the components used in the desalination process have been designed.

## Keywords

desalaination, reverse osmosis,filtration

**ICIRIST-ERP-033**

# AN EVALUATING THE ENDURANCE PROPERTIES OF REINFORCED CONCRETE WITH STEEL AND POLYPROPYLENE FIBERS UNDER NATURAL WEATHERING CONDITIONS THROUGH EXPERIMENTATION

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## ABSTRACT

Fibre reinforced concrete (FRC), FRCs is more likely to deteriorate both within and externally. This explains why, despite FRC's many benefits, the building sector is hesitant to implement it. Examining the impact of natural weathering on prestressed concrete girders is the primary goal of this study. These girders are made up of two girders reinforced with steel fibers (SFRC), two with polypropylene fibers (PPFRC), one with both fibers, and one control mix. For a period of 26 months, the specimens were exposed to the open atmosphere naturally. Unit weight, compressive strength, water absorption, porosity, sorptivity coefficient, chloride penetration test, scanning electron microscope analysis, and energy dispersive X-ray analysis are among the durability properties that were examined. It was over.

**Keywords**
Prestressed concrete, Sorptivity, Polypropylene fibers, Durability, Compressive Strength.

**ICIRIST-ERP-034**

# A Study on Consumers Pharmaceutical Buying Behavior: Prescribed and OTC Medications

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## ABSTRACT

Consumer pharmaceutical buying behavior of prescribed and OTC medications are influenced by corporation image, advertisement etc.These may cause lot of adverse effects on health of the consumer. The investigator has conducted the study on "Consumer pharmaceutical buying behavior: Prescribed and OTC medications.

Objectives: To determine the factors Influencing the Purchase Decision of prescribed and OTC medications 2. To analyze the factors adopted by the consumers to purchase OTC Medications.A quantitative research approach of descriptive research design was used. By using simple random sampling technique a total of 60 samples were recruited and data were examined using statistical methods. Factors Influencing the Purchase Decision of prescribed and OTC medications, unveiled the significant difference in influencing factors of consumers' decision in purchase of the medications at level $p<0.05$. Analysis of Influence of Advertisement Posters on Purchase Decision of Medications in Pharmacy and first intension to visit pharmacy to purchase prescribed medicines or OTC medicines disclosed the significant difference at level $p<0.05$ . Factor Analysis on OTC Medicines Adopted by the Consumers disclosed that use of OTC medicine is high risk and may lead to adverse effects.

Conclusion: OTC medicines can lead to serious health problems like addiction on prolonged use and organ damage.

**Keywords**
Consumer buying Behavior, prescribed medicine & OTC medications.

ICIRIST-ERP-035

# A MACHINE LEARNING BASED CLASSIFICATION AND PREDICTION TECHNIQUE FOR DDOS ATTACKS

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## ABSTRACT

Distributed Denial of Service (DDoS) attacks are the most common name for distributed network attacks. These attacks make use of restrictions on any arrangement asset, like the structure of the authorized organization's website, which they exploit. In the current exploration study, the creator chipped away at an old KDD dataset. It is important to work with the most recent dataset to distinguish the present status of DDoS assaults. For the classification and prediction of DDoS attack types, this paper utilized a machine learning strategy. The classication algorithms Random Forest and XGBoost were utilized for this purpose.

To get to the exploration proposed a total structure for DDoS assaults expectation. Python was used as a simulator and the UNWS-np-15 dataset was extracted from the GitHub repository for the proposed work. For the purpose of determining the performance of the machine learning models, we produced a confusion matrix following their application. In the main order, the outcomes showed that both Accuracy (PR) and Review (RE) are 89% for the Irregular Woods calculation. The proposed model's AC is 89% on average, which is excellent and sufficient. The XGBoost algorithm's Precision (PR) and Recall (RE) were found to be approximately 90% for the second classification. Our suggested model has an AC of 90% on average. The accuracy of defect determination was significantly improved by approximately 85 percent and 79 percent when compared to previous research.

**Keyword**
DDOS, DOS, AI, XGBOOST, MACHINE LEARNING

**ICIRIST-ERP-036**

# Role of E-Commerce platform


## ABSTRACT

Recently the e-commerce platform is playing an important role in some areas, its activities are a subset of e-business activities. The aim of this paper is to build and develop a reliable website based on the e-commerce theories, developing elective well-designed web pages. This website wiff sell computer products include far Dvare and software). For implement the selling online website, it needs to use current technologies to achieve this goal. As a first stage, it should set up online ecommerce store with easy-to-use. Then improve the customer experience, and lastly implement the Direct Online Sale bergen Noisiness to consumer implement electronic payment methods. All these techniques should be based on deliberated plan according to strategy of electronic commerce with implement the current technology to ensure a good revenue to the company.



**Keywords**

E-Commerce, Sales, E- Business, Customer Relation, Behmiior.

**ICIRIST-ERP-037**

# A ROBUST OF DENSE NEURAL NETWORK FOR COTTON DISEASE DETECTION

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## ABSTRACT

Cotton is one of the most important crops in the world and gives many farmers a considerable source of income. However, cotton production is frequently difficult due to a number of diseases that have the potential to drastically reduce yields. Cotton leaves can be harmed by Fusarium wilt, Verticillium wilt, and Cotton leaf curl virus. Skilled naked eye inspection is the method that is most frequently selected and utilized in practice to identify plant diseases. With the aid of early diagnosis and precise forecasting of these illnesses, farmers can reduce crop losses by taking preventative measures. According to earlier research, deep network CNN models have many drawbacks, including a large number of parameters, protracted training times, expensive storage and processing, and a low identification accuracy of 89%. In this proposed model we use DenseNet algorithm, a deep learning technique, the suggested system achieves state-of-the-art performance in picture identification tasks. The suggested method can help cotton growers detect and stop the spread of plant diseases, boosting crop yields and profitability. A farmer can decrease the effects of diseases on their cotton crops by taking the appropriate precautions and adopting the preventative management strategy. Overall accuracy for the suggested model was 98.8%.

**ICIRIST-ERP-038**

# LORAWAN BASED SMART FARMING MODULAR IOT ARCHITECTURE

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## ABSTRACT

The Internet of Things (IoT) is one of the most promising application areas in information technology for forthcoming products and services. And the agriculture field is changing expeditiously, pointing to the future of automated and embedded systems with a bunch of sensors to monitor and curb the flourishing plants in a way to profit from them. The persistent monitoring and controlling of distantly located plants is a labour-intensive and technically tough business. In modern agriculture, a wireless sensor network (WSN) provides a simple, cost-effective solution to monitor and control. However, one of the major issues with IoT is still a conversation between devices, notably in the long-range. It implies that LoRa is lately accepted as a suspicious communication technology due to its properties, such as long-range, two-way communication, and low cost. It is stated that the communication distance of LoRa is up to 10 km [1], but it is not clear what this measure does. The communication distance is affected by environmental conditions, the parameters of devices, etc. Here we merge the LoRa WSN technology in the agriculture sector for long-distance, low-cost communication. This report presents a comprehensive study on leveraging LoRaWAN technology for collecting agricultural data from end nodes, transmitting it to a cloud platform through gateways, and utilising deep learning algorithms to predict weather patterns. The research involves the implementation of a system where agricultural data is collected, processed, and analysed in the cloud, leading to accurate weather predictions. A web-based visualisation tool for the collected data is also presented to validate the LoRaFarM architecture.

ICIRIST-ERP-039

# Usage Credit Cards


## ABSTRACT

The rapid evolution of the technology, the world is turning to use credit Cards instead of cash in their daily life, which opens the door to many new ways For fraudulent people to use these cards in a bad way. According to the Nilson Report, global card losses are expected to exceed $35 billion by 2020. To ensure The safety of users for these credit cards, the credit card's provider should Provide a service to protect users from any risk they may face. Consequently, We present our approach to predict legitimate or fraud transactions on the IEEECIS Fraud Detection dataset provided by Kaggel. Our model is BiLSTMMaxPooling-BiGRUMaxPooling which based on bidirectional Long short-term Memory (BiLSTM) and bidirectional Gated recurrent unit (BiGRU). We also Applied six machine learning classifiers which are: Naïve base, Voting, Ada Boosting, Random Forest, Decision Tree, and Logistic Regression. Comparing The results from machine learning classifiers and our model the results show That our model achieved better as we got 91.37% score.

**ICIRIST-ERP-040**

# IOT BASED REAL TIME WIRELESS SENSOR NETWORK FOR CONTAMINATION DETECTION IN DRINKING WATER DISTRIBUTION SYSTEM

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## ABSTRACT

The expeditious developing of the wide urban residential areas promulgate the extension as well as the contraption of the existing water deliver accommodation. Along with this one more complication is determine in the water produce channels, a few people use ½ HP to 1 HP pump to absorb the water precisely from the medium of their home street. Process computerization system based upon performance of a mechanical Programmable Logic Controller (PLC) and PC systems containing all the network segments produce the preferred way to enhance the aqua disposal technological process. The water embezzlement can be best controlled by the continue discrepancy given by the flow sensors supported on the tunnel. The system consist of Remote Terminal Units – RTU , unambiguous transducers and actuators distributed on a wide geographical area and control, power panels for the pump established. The reliable mechanism associated to PLC or RTU assure real time monitoring of the important technological specifications of high water disposal networks. The information bequeathed of SCADA system (Supervisory Control and Data Acquisition) exemplify the sponsor for escalation of the process and data- driven Decision Support System. Our approach is based on the advancement of low amount sensor nodes for actual time and in-pipe monitoring and appraisal of aqua capacity on the fly. The important sensor node contains several in-pipe electrochemical and optical sensors and insistence is given on low rate, incompetent implementation, and predictable long time enterprise. Such implementation is adaptable for enhanced scale distribution permissive sensor network approach for contribute spatiotemporally elegant information to water consumers, companies, and ascendancy. Comprehensive literature and market research are performed to find out low rate sensors that can accurately control several specifications, which can be used to ascertain the aqua capacity.

**Keywords**
Sensor Placement, Water Distribution System, Contamination Detection, Cost Efficiency

**ICIRIST-ERP-041**

# FUZZY CLUSTERING BASED CROP YIELD PREDICTION WITH STRUCTURED ASPECT OF SEGMENTING

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## ABSTRACT

In the growth of economy the agriculture plays an important role and the production of the crop is dependent upon some natural factors like water, soil, fertility, etc. The soil fertility is a significant source of nutrients that are needed for plant growth. Machine Learning (ML) is a dynamic approach in the digital world for analysing large datasets to obtain efficient results through data mining. The proposed system has been taken the soil nutrients of large datasets to suggest suitable fertilizer using advanced machine learning algorithms with data mining. The proposed method of Machine Learning algorithm of Hybrid Quantization Cascaded Neural Network (HQ-CNN) is used to analyse the soil fertility by soil nutrients. In agriculture, Soil fertility is fundamental for crop production, essential to measure the quality of the soil and this depends upon the capacity of soil nutrients. There are three major soil nutrients are nitrogen (N), phosphorus (P), and potassium (K) and this together defined as NPK this is obtained in the soil. The proposed research aims at restoring the levels of Nitrogen, phosphorous, potassium in the soil by measuring the number of nutrients present. This paper focuses on recommending soil fertility by using Machine learning classifier algorithms such as HQ-CNN as a learner for crop production with efficiency and high accuracy through soil nutrients. The machine learning approaches combined with data mining brings out the novel ways in improving the accuracy of classifying soil nutrients analysis to recommend soil fertility. For evaluation propose loss measurement is declared as root relative square error (RRSE), Mean Bias Error (MBE), and statistical measures are noticed.

**ICIRIST-ERP-042**

# MACHINE LEARNING BASED HATE SPEECH DETECTION AND CLASSIFICATION IN TWITTER-SOCIAL MEDIA NETWORK


## ABSTRACT

Twitter and other social media platforms have become entwined in our lives. They give us a place to tell our stories and share our ideas with the world. On the other hand, there are some people who take advantage of these platforms' freedom of expression to spread hateful and derogatory content. This is a significant issue in today's society, and it is difficult to identify such content. Natural language processing methods are used to propose a method for detecting hate speech on social media in this research paper. We utilize an openly accessible dataset given by Crowd Flower and perform text pre-handling to clean the dataset.

After that, we use feature engineering to find important features that can be used in classification algorithms for machine learning. Each feature set's performance is compared to that of other algorithms, and the outcomes are thoroughly examined. In the fight against the spread of hate speech, especially on social media, automated hate speech detection is an important tool. For the job, numerous approaches have been developed, the most recent of which is based on deep learning. Additionally, a number of datasets have been created to demonstrate various manifestations of the hate speech detection issue. Through the three most widely used datasets, we present a large-scale empirical comparison of deep and shallow hate speech detection methods. Our objective is to highlight developments in the field and determine the current state of the art's strengths and weaknesses Using Hybrid technique to classify speech such as random forest, decision tree, and Support vector machine.



## Keywords

Hate speech detection, social media, Natural Language Processing, Machine Learning, Artificial Intelligence, Sentiment Analysis

**ICIRIST-ERP-043**

# COVID-19 Smart Health Monitoring System Utilizing IOT Technology

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## ABSTRACT

Technology plays a significant role in healthcare, encompassing sensory devices, communication tools, recording devices, and display devices. Monitoring various medical parameters and post-operative progress is crucial, leading to the adoption of the latest trend in communication methods using the Internet of Things (IoT). The IoT acts as a catalyst for healthcare, playing a prominent role in a wide range of healthcare applications. In this particular project, a PIC microcontroller serves as a gateway to communicate with various sensors such as a temperature sensor and pulse oximeter sensor. The microcontroller collects sensor data and transmits it to the network via Wi-Fi, enabling real-time monitoring of healthcare parameters for doctors. The data can be accessed by the doctor at any time. Additionally, the controller is connected to a buzzer to alert the caretaker in case of variations in sensor output. However, a major concern in remote patient monitoring systems is securely transmitting data to the intended destination and allowing access only to authorized users. To address this security issue, the data is transmitted through a password-protected Wi-Fi module, specifically the ESP8266, which encrypts the data. Standard users and doctors can access the data by logging into the HTML webpage. During critical situations, an alert message is sent to the doctor through a GSM module connected to the controller, enabling prompt provisional medication. This system exhibits efficiency with low power consumption, easy setup, high performance, and timely responses.

**ICIRIST-ERP-044**

# Diabetic Retinopathy Detection Using Red Lesion Localization & CNN

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## ABSTRACT

Detecting early signs of diabetic retinopathy (DR) is critical for preventing vision loss through timely treatment. Automated localization of lesion-containing regions in retinal images can significantly aid specialists in the detection process. In this research, we developed a lesion localization model using a deep network patch-based approach. The primary aim was to enhance model performance while reducing complexity. To achieve this, we implemented an efficient procedure, employing two convolutional neural network models for selecting training patches which prioritized challenging examples, giving them special attention during the training process. Leveraging region labelling, our model could provide a DR decision for the original image without the need for specialized training. The model was trained on the Standard Diabetic Retinopathy Database, Calibration Level 1 (DIARETDB1), and tested on various databases, including Mission, without further adaptation. It achieved an area under the receiver operating characteristic curve of 0.912 (95% CI: 0.897-0.928) for DR screening and a sensitivity of 0.940 (95% CI: 0.921-0.959). These values are competitive with other state-of-the-art approaches in the field.

**Keywords**

Convolutional neural networks (CNN); Deep learning; Diabetic retinopathy; Retinal images.

**ICIRIST-ERP-045**

# DEEP LEARNING WITH THE YOLO V4 MODEL FOR DRONE DETECTION AMONG BIRDS

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## ABSTRACT

Drones are becoming increasingly popular in various fields, including military and commercial applications. However, the challenge lies in detecting drones from birds, which can be difficult using traditional methods such as radar systems and machine learning algorithms with limited accuracy. The objective is to identify the presence of drones in image sequences that include birds in the background. Only when a drone is present should algorithms detect and label a restricted area and they shouldn't alert birds. To address this issue, we propose a deep learning algorithm for drone detection using the YOLO V4 Model. This study involves the use of computer vision technology to identify and track drones in areas where birds are present. The YOLO v4 model is a state-of-the-art object detection algorithm that uses convolutional neural networks (CNNs) to identify and track objects in real time. The deep learning algorithm utilizes a large dataset of images to train the model to recognize the unique features of drones, such as their shape, size, and movement patterns. This allows the model to accurately detect and track drones even in challenging environments with complex backgrounds and lighting conditions. This model significantly improves accuracy, making it an effective tool for drone detection in various applications. Deep Learning mechanism enables great impact for Object detection in the case of drones. Performance analysis generated improved results in accuracy.

**Keywords**

optimal speed and accuracy of the proposed system in Object detection enables it to suit real-time applications compared to other architectures

**ICIRIST-ERP-046**

# GESTURE DETECTION AND CONTROL SYSTEM USING DEEP LEARNING

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## ABSTRACT

Gesture detection and control systems have emerged as an innovative and intuitive way to interact with electronic devices, bridging the gap between humans and machines. This paper presents a comprehensive review of the advancements, applications, and challenges in gesture based technologies. The evolution of gesture detection systems has been fuelled by the growing demand for natural and user-friendly interfaces in diverse domains such as gaming, virtual reality, healthcare, and smart environments. Various sensing technologies, including cameras, accelerometers, gyroscopes, and depth sensors, have been employed to capture and interpret human gestures accurately. The review explores the diverse applications of gesture control systems, ranging from entertainment and gaming to healthcare and industrial automation. Gesture-based interfaces offer a hands-free and immersive experience, enhancing accessibility and user engagement. In healthcare, for instance, gesture control finds applications in rehabilitation exercises and surgical procedures, minimizing physical contact and improving precision. However, the implementation of gesture detection and control systems comes with its set of challenges. Ensuring robustness, accuracy, and real-time responsiveness poses technical hurdles. Environmental factors such as varying lighting conditions and occlusions can impact the performance of gesture recognition algorithms. The paper also discusses the future prospects of gesture-based technologies, including the integration of deep learning for more intelligent and adaptive gesture recognition. Additionally, the potential impact of augmented reality and virtual reality on gesture interfaces is explored

**ICIRIST-ERP-047**

# Advanced Sentiment Analysis on IMDB Movie Reviews with Optimized Weighted Attention: A Technical Deep Dive into Attention-Enhanced BiLSTM Models

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**Abstract**

This study presents an advanced sentiment analysis framework for IMDB movie reviews, integrating an optimized weighted attention mechanism into a sophisticated Bidirectional Long Short-Term Memory (BiLSTM) model. The proposed model exhibits a comprehensive understanding of contextual nuances by incorporating attention mechanisms, with optimized weights enhancing its ability to focus on key elements. Through a technical deep dive, we elucidate the intricate architecture, showcasing the synergy between attention-enhanced BiLSTM and optimized weighted attention. Our experimentation and evaluation on the IMDB dataset demonstrate superior sentiment classification performance, outperforming traditional models. The optimized weighted attention allows the model to assign varying degrees of importance to different parts of the input sequence, capturing subtle nuances in sentiment expression. This technical exploration contributes to the evolving landscape of sentiment analysis methodologies, offering a nuanced perspective on sentiment classification in the domain of movie reviews.

**Keyword**

IMDB, BiLSTM

**ICIRIST-ERP-048**

# BLOCKCHAIN-BASED ANONYMOUS AUTHENTICATION OF CLOUD DATA USING STOCHASTIC DIFFUSION SEARCH ALGORITHM

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## ABSTRACT

Cloud security technology has been crucial in ensuring robust security within the cloud network. The extraction of data from the cloud can potentially include sensitive personal information, making it susceptible to hacking attempts. To safeguard individuals' privacy, various privacy protection technologies have been developed, with anonymity being a prominent one. Traditional anonymous methods are employed to maintain personal privacy. However, ensuring privacy in the cloud presents challenges, particularly in processing incremental data due to constant updates in cloud data. To address this, hierarchical sub-tree formation techniques are utilized to anonymize sub-trees effectively. A hybrid approach leveraging k-anonymity is adopted to achieve efficient sub-tree anonymization and enhance security in the cloud computing environment. The anonymization process involves the introduction of a new Stochastic Diffusion Search algorithm based on k-anonymity. This method facilitates the identification of anonymized users within the cloud blockchain network. The proposed framework aims to develop a hyperledger that enables authenticated user communication within a private network. The Stochastic Diffusion Search algorithm is employed to search for hash codes in the blockchain ledger and user queries in the cloud network. Ultimately, the process yields anonymous data, effectively thwarting hackers' attempts to access personal information about individuals.

## Keyword

k-anonymity-based Stochastic Diffusion Searchalgorithm, Blockchain, cloud data.

**ICIRIST-ERP-049**

# Low Power Lossy Networks for Routing Protocols

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## ABSTRACT

Low Power and Lossy Networks (LLNs), characterized by resource-constrained nodes, present challenges such as high packet loss rates, low data rates, and instability. Wireless Sensor Networks (WSNs), a subset of LLNs, play a crucial role in remote data collection, particularly in fields like environment monitoring and fire early warning systems. As WSNs are often powered by batteries, their energy efficiency directly impacts network longevity. The Routing Protocol for Low Power and Lossy Networks (RPL) is designed to address these challenges, but its performance degrades under wireless interference. This study proposes a modified DODAG discovery process to mitigate packet loss impact. Additionally, a Quality of Information (QoI)-aware local DODAG discovery method is introduced, optimizing network topology and reducing energy consumption in RPL-based event detection WSNs. The approach involves selecting appropriate parent nodes, improving DODAG structure in noisy environments, and fusing/transmitting sensor data based on QoI, thereby enhancing energy efficiency while maintaining information quality.

## Keywords

packet loss rates, routing protocol, Quality of Information(QoI),DODAG.

**ICIRIST-ERP-050**

# CROSS-ANALYSIS OF NETWORK INTRUSION DETECTION SYSTEMS BASED ON MACHINE LEARNING

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## ABSTRACT

The Internet of Things (IoT) is a promising innovation that brings enormous advantages if utilized ideally. In addition, the lack of security for IoT devices has increased cyber security threats. Using supervised machine learning (ML) to enhance network intrusion-detection systems (NIDS) is difficult. MLNIDS must be trained and evaluated, which requires data with clear labels for benign and malicious samples. Such names request exorbitant master information, bringing about an absence of genuine arrangements, as well as on papers continuously depending on similar obsolete information. We show the plan, execution, and assessment of Citrus: a novel framework for network intrusion detection that is adept at dealing with new threats by collecting and labeling live attack data from various Internet vantage points to distinguish between malicious and benign attacks. We are carrying out machine learning calculation (SVM and Arbitrary Woodland) our proposed irregular timberland calculation gives high precision and forecast.

## Keyword

Machine Learning, Intrusion Detection Systems, Network Security, Evaluation

**ICIRIST-ERP-051**

# BERSIH

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## ABSTRACT

The project, "Clean Society with Digitalization," aims to leverage digital technology to promote sustainability and cleanliness in tier-one cities. BERSIH, which means clean, is our project's motive. It is the responsibility of every individual to maintain cleanliness in our tier 1 city. However, we still need to take it to the next stage by extending it to tier 2 and 3 cities. People follow many methods to remove garbage, and our government has made many arrangements for its disposal. However, a lot of waste is still unnecessarily produced. This project provides a solution to prevent that. As the country goes digital, we should not forget about the way we litter. This initiative will involve the use of smart cards to track daily paper usage and disposal, providing valuable data that can be used to encourage more environmentally friendly behaviours. The smart card's main role is similar metro card, it helps users identify a manage garbage status to easily develop instructions. The project aims to leverage digital technology to promote sustainability and cleanliness in tier-one cities. The initiative will involve the use of smart cards to track daily paper usage and disposal. "Clean Society with Digitalization" is a project of BERSIH.

## Keywords

Project, cleanliness, clean, disposal, garbage, smart, cards, however, cities, tier.

**ICIRIST-ERP-052**

# Developing a Blockchain-Based eVault for Legal Records

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## ABSTRACT

The objective of this hackathon is to develop a blockchain-based eVault system for legal records that can ensure security, transparency, and accessibility for all stakeholders. The system should be able to store, manage, and share legal records securely and efficiently, with the potential to integrate with existing legal databases and case management systems. A presentation of the prototype, design document, and business plan. Impact: A functional prototype of the blockchain-based eVault system for legal records, with a user-friendly interface and features such as document upload, retrieval, and sharing. The development of a blockchain-based eVault system for legal records can have a significant impact on improving access to justice in India. It can lead to faster, more efficient court proceedings, reduced costs, improved data integrity, and increased trust in the justice system. Moreover, it can provide a secure and transparent platform for storing and sharing legal records, making it easier for clients to access their own records and for lawyers to access relevant case information.

## Keywords

Blockchain, eVault.

**ICIRIST-ERP-053**

# AI-powered Legal Documentation Assistant

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**ABSTRACT**

Legal documentation can be a complicated and time-consuming process, especially for individuals and small businesses who may not have access to legal resources. In addition, the language and jargon used in legal documents can be difficult for non-lawyers to understand, which can lead to errors and misunderstandings. The objective of this hackathon challenge is to develop an AI-powered solution that can simplify legal documentation for individuals and small businesses in India, by automatically drafting legal documents in plain language and using easy-to-understand terms. By simplifying legal documentation, this solution can potentially save time, reduce errors, and increase access to justice. Participants can use publicly available legal databases and resources to train the AI model for document generation. A working prototype of the AI-powered legal documentation assistant, demonstrating its functionality and ease of use. Code and documentation for the solution, along with instructions for deployment and maintenance. Participants are encouraged to consider the ethical implications of their solution and to prioritize data privacy and security.

**Key words**

Jargon language, AI model, legal database

**ICIRIST-ERP-054**

# Predicting Emotions from Text Using Computing Technique

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**ABSTRACT**

Emotions play a vibrant role in the discussion, as they convey the context of the conversation. Text/word in conversation comprises of lexical and contextual meanings. Identifying emotions using the text is an intriguing task in recent times. With the progress of soft computing techniques and hardware to support the machine learning process, detecting emotions from text with the support of machine learning yields promising and noteworthy outcomes. We suggest a real-time text communication system based on individuals' conversations. The primary challenge for an emotion detection system is efficient feature extraction. It entails improving effective communication between individuals. The developed system achieved an impressive result of 99.25% happiness, 90% surprise, and 80% sadness.

**ICIRIST-ERP-055**

# REAL TIME DRIVER DROWSINESS DETECTION USING MACHINE LEARNING

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## ABSTRACT

Drowsiness of drivers is one of the significant cause of road accidents. Every year, there is an increase in the amount of deaths and fatal injuries globally. By detecting the drivers drowsiness, road accidents can be reduced. This paper describes a machine learning approach for drowsiness detection. Face detection is employed to locate the regions of the drivers eyes, which are used as the templates for eye tracking in subsequent frames. Finally, the tracked eyes images are used for drowsiness detection in order to generate warning alarms. This proposed approach has three stages: detecting Face, detecting Eyes and detecting drowsiness. Image processing is used to recognize the face of the driver and then its extracts the image of the eyes of the driver for detection of drowsiness. The HAAR face detection algorithm takes as captured frames of image and then the detected face is considered as output. Next, CHT is used for tracking eyes from the detected face. Using EAR (Eye Aspect Ratio) the eye state is detected. The proposed system was tested by implementing the proposed approach on a Raspberry pi 3 Model B with 1GB RAM with use of Logitech HD Webcam C270. The system uses frames for face and eye tracking, and the average correct rate for eye location and tracking could achieve 95.0% based on some test videos. Thus, the proposed approach for a real-time of driver drowsiness detection is a low cost and effective solution method.

## Keywords

Driver Monitoring System; Drowsiness Detection; Deep Learning; Real-time Deep Neural Network; Android.

**ICIRIST-ERP-056**

# ROLE OF AGRICULTURE SECTOR


## ABSTRACT

Agriculture and its allied sectors are undoubtedly the largest providers of livelihoods in rural India. The agriculture sector is also a significant contributor factor to the country's Gross Domestic Product (GDP). Blessing to the country is the overwhelming size of the agricultural sector. However, regrettable is the yield per hectare of crops in comparison to international standards. This is one of the possible causes for a higher suicide rate among marginal farmers in India. This paper proposes a viable and user-friendly yield prediction system for the farmers. The proposed system provides connectivity to farmers via a mobile application. GPS helps to identify the user location. The user provides the area & soil type as input.Machine learning algorithms allow choosing the most profitable crop list or predicting the crop yield for a user-selected crop. To predict the crop yield, selected Machine Learning algorithms such as Support Vector Machine (SVM), Artificial Neural Network (ANN), Random Forest (RF), Multivariate Linear Regression (MLR), and K-Nearest Neighbour (KNN) are used. Among them, the Random Forest showed the best results with 95% accuracy. Additionally, the system also suggests the best time to use the fertilizers to boost up the yield.

**ICIRIST-ERP-057**

# BRAIN TUMOR CLASSIFICATION USING PRETAINED DEEP CONVOLUTIONAL NEURAL NETWORKS

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## ABSTRACT

Brain diseases classification is the most challenging process due to their sensitivity, the difficulty of executing operations, and the high expenses. Brain tumors are a significant and potentially life-threatening medical condition that demands accurate and timely diagnosis for effective treatment planning. The dataset is divided into training and testing sets, ensuring a balanced distribution of samples for each class. On MRI scans, many procedures are needed to identify tumors, including image pre-processing, feature extraction, and classification. The findings will be revealing several notable advantages of LSTM model. The hybrid learning models automatically learning hierarchical features from raw image data, eliminating the need for manual feature engineering. This feature extraction capability enables CNNs to capture subtle and complex patterns within brain images, enhancing their diagnostic accuracy. The results of proposed work will demonstrate the effectiveness of the proposed method to detect the brain tumors, which will achieve high accuracy, precision, recall and F1-measure. Based on model accuracy, user can input the test brain MRI image to predict the tumor with types and also provide the diagnosis details about predicted disease. Experimental results show that the proposed models provide improved efficiency in disease prediction.

**ICIRIST-ERP-058**

# Face recognition attendance system using raspberry pi

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**ABSTRACT**

In the rapidly evolving landscape of technology , the need for efficient and secure attendance management systems has introduces a sophisticated solution employing face recognition technology on the Raspberry Pi platform to address this requirement . become paramount . This project The system maps facial features into a coordinate structure , enabling precise detection of faces using a Multi - task Cascade . Raspberry Pi serves as the central component of this project , offering a cost - effective and energy - efficient solution . The lightweight and compact nature of the Raspberry Pi make it an ideal choice for deployment in educational institutions , businesses , or any setting where attendance monitoring is essential .

**ICIRIST-ERP-060**

# INTEGRATED HEALTH ASSESSMENT AND SMART VENTILATION CONTROL

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## ABSTRACT

The integration of comprehensive health evaluation and automated ventilation control has emerged as a critical solution in modern healthcare. This system delivers real-time data updates via IoT and LCD interfaces by using temperature monitoring alongside continuous tracking of vital indicators such as heart rate and oxygen saturation levels. Importantly, when abnormalities in heart rate or oxygen saturation levels are identified, an automated servo motor activates the ventilator, giving prompt respiratory support. Concurrently, an audible alarm system notifies all parties involved, including medical staff and concerned family, allowing for fast reaction and care. This ground-breaking solution tackles important issues in hospital environments. Its application transforms patient care by providing a proactive method of ventilation management and health monitoring. Improved patient safety and expedited response mechanisms benefit hospitals, lowering the risks of postponed intervention. Real-time updates and timely warnings can provide families peace of mind and encourage a greater sense of involvement and assurance about the well-being of their loved one. In addition to improving patient outcomes, this technological integration in healthcare also fortifies relationships between medical facilities and the patient support systems.

**ICIRIST-ERP-061**

# IOT BASED BATTERY MONITORING SYSTEM IN ELECTRIC VEHICLE

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## ABSTRACT

As electric vehicles become more popular, it's crucial to monitor the health and performance of their batteries to ensure optimal efficiency and longevity. Our system consists of three main components: battery sensors, a gateway device, and a cloud platform. The battery sensors are placed in each battery cell to measure key parameters such as voltage, current, temperature, and state of charge. These sensors transmit data wirelessly to the gateway device, which aggregates and processes the data before sending it to the cloud platform. That is why we must rely on those that are of in the least harmful to the environment and inexpensive. There are also additional benefits: Photo voltaic panels and photovoltaic plants use the naturals un-light for additional lighting. photovoltaic cells are used in applications that allow the use of taking solar energy and expanding it into electricity most of the solar systems are situated in sparsely populated regions, large-scale agricultural communities, as well as in medium-sized farm sites and smaller, agricultural local agricultural production facilities that have power grids For a machine to function, it must be operated by a human. This is a hardware- timed sensor system that tracks various variables, like temperature, voltage, and fire and battery percentage and reports them on the cloud so you can see exactly when everything has reached the right value.

## Keywords

IOT, Battery.

**ICIRIST-ERP-062**

# SMART NAVIGATION AND ENERGY MANAGEMENT FRAMEWORK FOR AUTONOMOUS ELECTRIC VEHICLES IN COMPLEX ENVIRONMENTS

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## ABSTRACT

Autonomous Electric Vehicles (AEVs) are revolutionizing the world of smart city transportation due to their low resource consumption, improved traffic efficiency, zero carbon emissions, and improved road safety. To ensure the safe passage of vehicles through a complex environment, it is essential to plan for safe and smart navigation and energy management for AEVs. This demands an effective model for locating the optimal Electric Charging Stations (ECS) for scheduling and recharging the AEVs when they run on low battery. The number of Electrical Vehicle (EV) charging stations is steadily increasing everyday as electric vehicles become more popular. With the proliferation of electric vehicles and their predicted sales growth in the near future, battery recharging will pose many challenges. In this paper we will introduce a smart power meter to recharge the electric vehicle. IOT technology is implemented to handle the electric vehicle (EV) recharging process. The proposed EV charging station draws current from the utility grid at low total harmonic distortion (THD). The optimal charging discharging pattern of electric vehicles reduces the economic cost of the unit commitment problem.

## Keywords

IOT, AEVs, Optical charging

**ICIRIST-ERP-063**

# PERFORMANCE ANALYSIS OF LLC RESONANT CONVERTER WITH OPEN LOOP AND PI CONTROLLER

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## ABSTRACT

LLC resonant converters have gained significant attention due to their efficiency and ability to handle wide input voltage ranges. This study presents a comprehensive performance analysis of an LLC resonant converter employing both open-loop and Proportional-Integral (PI) controller configurations. The aim is to evaluate and compare the behaviors of these control schemes concerning efficiency, transient response, and steady-state performance.The open-loop configuration eliminates the The impact of varying operating conditions, such as load changes and input voltage fluctuations, on the converter's performance, is also investigated.Results indicate that while the open-loop configuration exhibits simplicity and reduced control complexity, it may suffer from limited dynamic response and poorer transient behavior. On the other hand, the PI controller enhances output accuracy and transient response at the expense of increased complexity and potential stability challenges.Insights gained from this comparative analysis provide a deeper understanding of the trade-offs between control strategies in LLC resonant converters. These findings contribute to optimizing controller design choices based on specific application requirements, balancing performance and implementation complexity.

**ICIRIST-ERP-064**

# Performance Exploration of Resonant Converter Using Open Loop and Pi Controller

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**ABSTRACT**

LLC resonant converters have gained significant attention due to their efficiency and ability to handle wide input voltage ranges. This study presents a comprehensive performance analysis of an LLC resonant converter employing both open-loop and Proportional-Integral (PI) controller configurations. The aim is to evaluate and compare the behaviors of these control schemes concerning efficiency, transient response, and steady-state performance. The open-loop configuration eliminates the need for feedback, simplifying the control strategy but potentially sacrificing precision. Insights gained from this comparative analysis provide a deeper understanding of the trade-offs between control strategies in LLC resonant converters. These findings contribute to optimizing controller design choices based on specific application requirements, balancing performance and implementation complexity. This study contributes to advancing the understanding of LLC resonant converter control methodologies, aiding engineers and researchers in selecting the most suitable control scheme for various practical applications.

**ICIRIST-ERP-065**

# Analysis of Corticomuscular Coherence Between Cortical and Facial Muscle Activities

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## ABSTRACT

The most frequent human behavior is emotional, and this is where it is crucial to assess the functional relationship between the motor cortex and the muscles of the face. By comparing the coherence of the concurrently recorded electroencephalography (EEG) and electromyography (EMG) activities, this corticomuscular control is typically identified. The EEG-EMG coherence has been attempted to be estimated in this work utilizing magnitude squared coherence (MSC) functions. The concurrent EEG-EMG activity of 32 healthy volunteers was used for this purpose as they watched films in various emotional states. The magnitude squared coherence function is applied to the facial EMG signal of the zygomaticus major muscle and the EEG signal connected to the motor cortex region. Additionally, the connection between EMG signals and the alpha (8-13 Hz) and beta (14-29 Hz) spectral components of traditional EEG frequency bands is also examined. The findings demonstrate a considerable electrical coherence between the brain and the facial muscles in a range of emotional states. The frequency band interactions are also discovered to differ for various emotional states. The analysis appears to be able to be expanded to include the development of corticomuscular function in patients with neurological disorders.

**Keyword**

EEG, EMG, Corticomuscular Coherence, Magnitude Squared Coherence

**ICIRIST-ERP-066**

# IOT BASED SMART WASTE MANAGEMENT FOR SMART CITY USING AURDINO

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## ABSTRACT

A big challenge in the urban cities is that of waste management as there is a rapid growth in the rate of urbanization and thus there is a need of sustainable urban development plans. As the concept of smart cities is very much trending these days and the smart cities cannot be complete without smart waste management system. There needs to be system that gives prior information of the filling of the bin that alerts the municipality so that they can clean the bin on time and safeguard the environment. In this proposed system, multiple dustbins from the different areas throughout the cities are connected using IOT technology. The dustbin uses low cost embedded devices and it will sense the level of dustbin, then it is sent to the municipality officer. Then the information is sent to the truck driver to collect the waste. The system is implemented with time stamp in which real-time clock is shown to the concern person regarding at what time the dust bin is full and when the wastes should be collected from the dustbins. It will also indicate the presence of any toxic gases in the bin.

**ICIRIST-ERP-067**

# BI-LEVEL MULTI-OBJECTIVE PLANNING MODEL OF SOLAR PV-BATTERY STORAGE-BASED DERS IN SMART GRID DISTRIBUTION SYSTEM

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## ABSTRACT

The Bi-level Multi-Objective Planning Model of Solar PV-Battery Storage-Based DERS in Smart Grid Distribution System is a research paper that proposes a planning model for the implementation of distributed energy resources (DERs) in a smart grid distribution system. The model is designed to optimize the deployment of solar PV and battery storage systems in the grid, while taking into account various technical, economic, and environmental factors. The proposed planning model is based on a bi-level multi-objective optimization approach, which considers both the objectives of the utility and the objectives of the DER owners. The upper-level objective is to minimize the total cost of energy supply to the grid, while the lower-level objective is to maximize the revenue of the DER owners. The model is implemented using a genetic algorithm, which is used to search for the optimal solution. The model is also capable of considering the uncertainties associated with solar PV and battery storage systems, such as weather conditions and battery degradation. The results of the study show that the proposed planning model can effectively optimize the deployment of solar PV and battery storage systems in a smart grid distribution system. The model is also shown to be robust to various uncertainties associated with DERs, such as weather conditions and battery degradation. Overall, the proposed planning model provides a valuable tool for the implementation of distributed energy resources in a smart grid distribution system. By optimizing the deployment of DERs, the model can help to reduce the cost of energy supply, while also improving the reliability and environmental performance of the grid.This project describes the multi objective battery sizing and storage system for grid connected system using renewable energy solar and wind system. Grid connected battery energy storage is implemented store the energy in battery. Effect of reduce capital cost reduction and improve the system stability In order to determine the best rated power and capacity of integrated PV-BESS system for residential and commercial users, the optimization has been performed for different combination of PV and BESS rated powers and capacities, evaluating, for each of them, the annual self- consumption.

**Keywords**

PV battery, Smart grid, Solar system etc.

**ICIRIST-ERP-068**

# Malware Botnet Detection Using Deep Reinforcement Learning in IoT Networks

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## ABSTRACT

In embedded systems, security is crucial as malware lurks in code, targeting the core with might. Remote execution and privilege escalation intensify the fight. Network breaches exploit vulnerabilities by, intercepting transmissions and casting a shadowy light. Smart grids face threats, including false data injections and disruptions all around. Denial of Service attacks are relentless, overwhelming grid systems and integrity. Smart meters are tampered with, breaching security measures and control. Mitigation strategies include encryption, intrusion detection, and secure boot mechanisms. Regular updates, vulnerability management, and physical security measures are essential. PSO-LSTM, a blend of optimization and accuracy, emerges as a solution for various domains, including rainfall runoff and ship motion prediction. The Pelican Optimization Algorithm takes flight, balancing exploration and nature-inspired solutions. Minimizing the surface area and focusing on peripherals and hardware security leads to a more secure embedded system landscape.

**ICIRIST-ERP-069**

# LOW COST SMART VACUUM CLEANER

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## ABSTRACT

The Arduino-based Smart Vacuum Cleaner/Robot research represents a pioneering effort in the realm of home automation and robotics. With a primary objective of creating an exceedingly efficient and fully autonomous cleaning solution, this paper leverages the capabilities of Arduino technology. Through the strategic integration of an elaborate sensor array and sophisticated algorithms, the smart vacuum cleaner ensures intelligent navigation, guaranteeing comprehensive coverage and meticulous cleaning within the designated area. Incorporating automated features, including obstacle avoidance mechanisms and real-time dust detection further emphasizes this paper's ingenuity. These enhancements not only contribute to the device's cleaning prowess but also elevate the user experience by minimizing manual intervention. The synergy between hardware and software components is a hallmark of this endeavor. This paper's success lies in the seamless fusion of these elements, resulting in a robust and user-friendly automated cleaning solution. This confluence of cutting-edge technology and meticulous design positions the smart vacuum cleaner as a trailblazer in the quest for innovative household tools. In conclusion, the Arduino-based Smart Vacuum Cleaner/Robot research stands as a testament to the possibilities within the intersection of robotics and everyday convenience. Its comprehensive and advanced features make it an indispensable addition to contemporary households, embodying a new era of effortless and intelligent cleaning solutions. In this proposed paper we designed and constructed a low-cost Smart Vacuum Cleaner/Robot that senses the dust continuously within the specified area and cleans the dust instantly. All the hardware circuits are controlled by the Arduino which is already programmed through software.

## Keyword

Vacuum Cleaner, Smart vacuum cleaner, Low cost vacuum cleaner, Vacuum cleaner Robot, Cleaning Robot

**ICIRIST-ERP-070**

# LOW COST ECO-FRIENDLY E-BICYCLE

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## ABSTRACT

In an era of growing environmental concerns, the transportation sector stands as a significant contributor to greenhouse gas emissions and air pollution. To combat these challenges, electric bicycles have emerged as a promising alternative to traditional vehicles, offering a sustainable and environmentally friendly mode of transportation However, the environmental impact of e-bikes is intricately linked to the materials used in their construction, manufacturing processes, and the energy sources employed for charging. This paper delves into the implementation of an eco-friendly e-bicycle, meticulously designed to minimize its environmental footprint throughout its life cycle. The proposed e-bicycle will be crafted from lightweight, recycled materials, ensuring a reduction in resource consumption and waste generation during manufacturing. Additionally, the manufacturing process will be streamlined to optimize energy efficiency and minimize environmental impact. To power the e-bicycle, a rechargeable battery will be employed, capable of being charged using renewable energy sources such as solar or wind power. Furthermore, the e-bicycle will be equipped with features that enhance its energy efficiency, including regenerative braking and an intelligent power management system. The implementation of this eco-friendly e-bicycle is anticipated to yield a multitude of benefits, including substantially reduced greenhouse gas emissions, and contributing to a cleaner and healthier environment. Reduced waste generation fosters a circular economy and conserves precious resources. The successful execution of this paper will serve as a testament to the feasibility of eco-friendly e-bikes. Moreover, the research will provide valuable insights into the design, manufacturing, and deployment of eco-friendly e-bikes, paving the way for a greener and more sustainable future. In this proposed paper, , hub motor for regeneration, BLDC motor for driving wheel, Lead acid battery for charging while online mode and offline mode. So we achieved an e-bicycle at a low cost.

**Keywords**

E-bicycle, Eco-friendly bicycle, BLDC motor drive bicycle, Low cost bicycle, Electric Bicycle

**ICIRIST-ERP-071**

# Implementation of SOLAR Photovoltaic EMULATOR for PV Installation

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## ABSTRACT

This research presents the development and validation of a solar PV emulator designed to accurately replicate the behavior and performance of photovoltaic (PV) systems. The emulator is a crucial tool for studying and analyzing various aspects of PV technology, including system performance, optimization, and the impact of different environmental conditions the solar PV emulator incorporates advanced modeling techniques to simulate solar irradiation, temperature variations, and other environmental factors that affect PV system operation. Through a thorough calibration process, the emulator demonstrates a close correlation between its predicted electrical output and the actual measured data from operational PV installations. This validation process ensures the reliability and accuracy of the emulator in replicating the performance of real-world PV systems.

**ICIRIST-ERP-072**

# COMPARATIVE STUDY ON PREPARATION COOKIES FROM TRITICUM SPICIES BY ENRICHING WITH NATURAL ANTIOXIDANT

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## ABSTRACT

The Experiment was conducted in Food Processing Laboratory, entitled with "Comparative study on preparation of cookies from triticum species by enriching with natural antioxidant" was performed to investigate the proximate analysis, sensory evaluation and nutritional analysis of the developed vegetables cookies. The results revealed that the addition of vegetables powder with the combination of purple wheat flour and wheat flour have a high effect on the sensory characteristics of cookies. The benefit of the vegetables biscuits is that lowers the sugar level, increase in antioxidants, visibility of eye gets clear and heart stay healthy. This cookie consists of fiber, protein, minerals and vitamins as a common source of nutrition. The antioxidant present in the cookies was highest. These vegetables involve more in healthy diet foods which helps to lose healthy weight. It detoxes the whole body to remove the toxins through the digestive tract.

## Keywords

Toxins, Triticum and Detoxes

**ICIRIST-ERP-073**

# SOLVING FUZZY LINEAR EQUATION USING CRAMER'S RULE

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## ABSTRACT

Many real-time engineering systems are too complex to be defined in precise terms and imprecision is often involved. Linear system of equations with uncertainty parameters plays a significant role in the areas of economics, finance, engineering, control system, and so on. To analyze such situation, fuzzy information is required. In this paper deals in solving fuzzy system of linear equations. There are many non-fuzzy classical methods to solve linear equations but, in this paper, solving fuzzy linear equation and solving linear equation using Cramer's rule are discussed.

## Keyword

Fuzzy set, fuzzy number, fuzzy linear equation, problem of finding an unknown number, solving linear equation using Cramer's rule, numerical example.

**ICIRIST-ERP-074**

# An Initial Value Problem for a Linear System of n Partially Singularly Perturbed Delay Differential Equations with Discontinuous Source Terms

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**ABSTRACT**

An Initial Value Problem (IVP) for a first order Delay Differential Equation (DDE) differs from its counterpart for an Ordinary Differential Equation in the fact that, for the determination of a unique solution, the latter requires just an initial condition specified at a point whereas the former requires the solution profile to be specified on an interval with length equal to the delay. For instance, consider the following IVP for a linear first-order differential equation. An initial or interior layer is defined to be the region of the independent variable over which the dependent variable changes rapidly. To distinguish between regular perturbation problems and singular perturbation problems, consider a family of BVPs $P_\varepsilon$, depending on a small singular perturbation parameter $\varepsilon$. Under certain conditions, a solution $y_\varepsilon(x)$ of $P_\varepsilon$can be constructed by the well known 'Method of Perturbation': that is, as a power series in " with its first terms $y_0$ being the solution of the problem P0 (obtained by putting $\varepsilon = 0$in $P_\varepsilon$). When such a power series expansion converges as $\varepsilon \to 0$ uniformly in $x$, its a regular perturbation problem. When $y_\varepsilon(x)$ does not have a uniform limit as $\to 0$ , this regular perturbation method fails and it is called a Singular Perturbation Problem (SPP). In many instances, the partial differential equations of hydrodynamics are singularly perturbed.

**ICIRIST-ERP-075**

# Role of Latest Marketing Trends

**ABSTRACT**

At the earlier of each year, there is always a lot of interest in predictions for the year ahead and the latest marketing trends. “What's Hot?” and “What's next?” are always the most common questions. Marketing is at the core of all business activities. Without marketing, Organizations cannot sell and without sales there is no revenue and without revenue people cannot run the business. The Digital marketing is a very diverse marketing activities used by most business for marketing and all types of products and services. Digital marketing includes social marketing, word ads, banner ads, window displays, video advertisement etc. At this juncture, forecasting, analyzing and implementing the innovative digital marketing would be the right choice for success of any business amid the cut-throat competition.This article focus on the exciting and Due to the emerging business trends association between digital marketing and artificial intelligence (AI). Even while proposing, the techniques of AI engagement in developing app. As a genuine branch of Marketing science, digital marketing management to create value to the organizations and enhance the engagement with the customers through electronic services. Nowadays marketing throughout the world make use of digital technology in order to enhance the service level delivered to their Customers efficiency in their business.

**Keyword**

Marketing, Digitalization, Artificial Intelligence, Customer efficiency

**ICIRIST-ERP-076**

# Artificial Intelligence plays an important role in Marketing Management

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## ABSTRACT

Today, every business or every person is so technologically connected that information can be passed to every corner of the world in a fraction of seconds, which has become an advantage for marketing management that will enable various companies to sustain in the market and generate revenue based on the strategy placed in the market.Artificial intelligence (AI) has the possibility of significantly alter customer views towards the organisation as well as its marketing strategies. AI has come up as a promising solution to the problem where many of the companies have adapted this technology to enhance their business in digital marketing as well as still many of the research is going on worldwide.In this paper we have discussed the various marketing platform of AI with its usage. The whole search has been done for the future aspects of AI in marketing filed which can be helpful for various researchers with future research directions in AI towards the marketing management.

**ICIRIST-ERP-077**

# Corporate Social Responsibility: A Review on definitions and theoretical perspectives

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## ABSTRACT

This paper reviewed different definitions of CSR and presented some summarized dimensions attributed to the definitions which represent the area of focus for the definitions including; Obligation to the society, related to the stakeholders , improve the corporate image and reputation, economic growth, ethical business practice, law abiding, voluntariness, human rights, environmental protection, transparency and accountability. The segment of this paper elucidates on theoretical perspectives of CSR in five categories; the classical view, the legitimacy, stakeholder, agency, institutional, CSR theories.

**Keywords**

Corporate Social Responsibility, CSR definition &Theories in CSR

ICIRIST-ERP-078

# Trends in research on project-based science and technology teaching and learning at K–12 levels: a systematic review

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## ABSTRACT

Project-based teaching is nothing new; it originates from the work of authors like Dewey and Kilpatrick. Recent decades have seen renewed interest in this approach. In many countries, it is currently considered to be an innovative approach to science and technology (S&T) teaching. In this article, we present a systematic review of what recent scientific publications teach us about this approach: How is this approach identified in these publications? How is the use of this approach in school S&T justified? What are the main research questions covered by studies in the field? What do these studies on this approach teach us? To answer these questions, we have selected and analysed articles published, between 2000 and 2014, in journals that are specialised in school science and technology education and that are indexed in ERIC database. In the synthesis based on this analysis, we present: (a) the theoretical constructs used by the authors to refer to this approach and the features identified to define it; (b) the justifications for this approach; (c) the research questions covered by studies in the field; (d) the data collection and analysis methods used in these studies; and (e) the main findings. In addition to presenting a synthesis of current research in this field, we offer a critical discussion thereof with a focus on two aspects, namely the way PBSTL is conceptualised and the rigour of the research methods used to ensure the validity of findings.

## Keyword

Project-based teaching; project-based learning; science education; technology education; systematic review

**ICIRIST-ERP-079**

# Design And Fabrication of IoT Based Air Purification Vehicle

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## ABSTRACT

The tremendous increase in the level of population and mechanization pollution has increased many folds. India became the world's eighth most polluted country in 2022 with an annual average PM2.5 concentration of 53.3 micrograms per cubic meter. If this situation continues, it will affect people's health and also huge impact on the GDP of the nation. Keeping in mind, we created a Iot Based Air purification vehicle. Smart Air Filter monitoring and controlling system is proposed in these projects, which enable us to monitor and check real time quality or the air temperature, humidity in specific region through IOT. The camera and internet connection which is helps to operate the vehicle from the any part of the globe. In this project we can also control the quality of air pollution by using air filtering. We hope that this project will create enormous impact on both indoor and outdoor environment.

## Keyword

Environment, Air pollution, Iot Vehicle, Air purifier, Sensors

**ICIRIST-ERP-080**

# Optimizing rotary tool-integrated ECM of AISI 202 through parametric analysis using RSM

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## ABSTRACT

Electrochemical Machining (ECM) is pivotal in processing the challenging materials like stainless steel, super alloys, and high-hardness substances. It has proven its ability to machine these materials without inducing thermal cracks or working stress in specimens. The investigation involves varying voltage, tool feed rate, electrolyte discharge rate, and rotary speed using a 15% NaCl aqueous electrolyte solution. Under identical operating conditions, the optimal outcomes for rotary-adapted machining are an MRR of 361.410 mm3/min and Ra of 1.62 µm at 18 V, 0.54 mm/min, 12 lit/min, and 100 rpm. These results represent an 11.9% reduction in both MRR and Ra compared to non-rotary tool machining.

## Keyword

ECM, rotary tool adapter, NaOH aqueous solution, MRR, Ra, RSM

**ICIRIST-ERP-081**

# The effect of Infill Density on Mechanical Properties of Chopped Carbon Fiber reinforced PLA Composites materials

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## ABSTRACT

In recent years, 3d printing has a major influence in the industrial revolution and brings a lot of change to mechanical properties. Before printing, After that, the digital file is sliced with infill density set as 60%, 80% and 100% and fabricated using VIPER SHAREBOT 3D Machine with different infill densities like 60, 80 & 100%. The Chopped carbon fiber/PLA(CCFP) filament were used for making composites materials. All the samples were printed as per ASTM standards such as ASTM D3039, ASTM D790 standards were carried out for tensile, flexural and impact respectively. Based on the experimental results, it suggested that high infill density 100% roduces maximum tensile strength, tensile modulus, tensile stress-strain, ultimate strain, maximum flexural strength, flexural modulus, impact strength compared to other CCFPC composites materials.

## Keyword

Fused deposition modelling, Tensile, Flexural, Impact strength, Scanning electron microscope

**ICIRIST-ERP-082**

# INVESTIGATION OF MATERIAL CHARACTERISTICS OF HYBRID BIOPOLYMERS FOR ANKLE KNEE REPLACEMENT

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## ABSTRACT

This investigation aims to assess the biopolymer characteristics of thermoplastic polyurethane (TPU) blended with polylactic acid (PLA) for potential use in implants. TPU and PLA are chosen for their biocompatibility, mechanical properties, and biodegradability. The mechanical performance of the blends have been tested under various conditions that mimic the implant's intended use. This includes tensile strength, flexibility, and fatigue resistance. The investigation has provided valuable insights into the potential merits of TPU-PLA blends as biopolymer materials for biomedical implants. The outcomes of this research contribute to the development of safe and more sustainable implant materials for healthcare applications. Comprehensive characterization of the TPU PLA blends, including mechanical testing such as tensile and compressive tests, flexural test,FTIR and TGA were conducted to evaluate their suitability for implant materials and the results revealed that the proposed biopolymer blends fulfill the stated conditions significantly.

## Keyword

Biopolymer, implants,healthcare applications,blends.

**ICIRIST-ERP-083**

# OPTIMIZATION OF DRY SLIDING WEAR BEHAVIOR OF AlSi10Mg ALLOY PRODUCED BY LASER-BASED POWDER BED FUSION USING RESPONSE SURFACE METHODOLOGY

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## ABSTRACT

The optimization of the dry sliding wear behavior of AlSi10Mg alloy components manufactured through Laser-Based Powder Bed Fusion (L-PBF). Wear test was performed on pin-on-disc equipment. The rotating disc is made of EN31 steel Counter face type. AlSi10mg Laser-based Powder Bed Fusion. The experiment is conducted by using pin-on-disc apparatus. Weight loss is measured by using a digital balance meter. The Volume loss is found out from weight loss and the measured density. Specific wear rate, coefficient of friction and temperature were calculated. Using the center composite design method, Regression equation, ANOVA and Model graph were plotted. The optimize value of load, sliding speed and sliding distance for minimum coefficient of friction and minimum wear rate were found out.

## Keyword

Laser-Based Powder Bed Fusion (L-PBF),AlSi10mg,Regression equation,Center composite design method.

**ICIRIST-ERP-084**

# Photo thermal performance and Thermo physical Properties of Erythritol Hybrid Nano PCM for Solar Energy Storage

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## ABSTRACT

In this study, GnP (Graphen Nano Platelets) and Al2O3 are dispersed in erythritol of composition 1 and 2 wt.% in the ratio of 1:1. The characterization of DSC, FT-IR, SEM, XRD, TGA were reported in this study. The optical absorbance of nanomaterial is reported in the wavelength ranges from 200 to 800 nm. The specific heat of the samples are reported, the drastic changes in the specific heat are observed at 120°C, and the corresponding values at 1 and 2 wt.% is found to be 11.7 and 7.20 J/g K. The FT-IR result reveals that there are no new bonds formed, and PCM doesn't chemically interact with the nanomaterials. The thermal degradation of all the samples is found between 280 to 320°C, respectively. The photothermal conversion performance of the pure PCM, 1wt.% and 2wt.% were done using a solar simulator with solar insolation of 750 W/m2. Compared to pure PCM, the temperature rise was higher for both nano-enhanced PCMs.

**ICIRIST-ERP-085**

# Enhancing Wear Resistance: A Comprehensive Review of Reinforced Aluminium Metal Matrix Composite

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## ABSTRACT

Wear resistance plays a vital role in ensuring the durability and performance of components subjected to mechanical wear. Researchers are increasingly focusing on composite materials due to their high performance and cost effectiveness. Non-ferrous metals, like aluminum, provide improved wear resistance compared to ferrous metals. Aluminum and its alloys offer significant advantages in terms of wear resistance. However, there is a need for a thorough review that specifically focuses on particle-reinforced aluminum metal matrix composites. This comprehensive review aims to explore and analyze the wear characteristics of reinforced aluminum metal matrix composites. It investigates the influence of various reinforcement materials, manufacturing techniques on the wear behavior of these composite. The findings from this review provide valuable insights for improving wear resistance in diverse industries through the design and development of aluminum based composites. These findings also lay the groundwork for future research and in this field.

**Keyword**

wear resistance; reinforcement; aluminum metal matrix composite

**ICIRIST-ERP-086**

# Synthesis of fatty acid methyl ester from indigenous Millettia ferruginea seed oil using waste chicken eggshell derived calcium oxide as a heterogeneous catalyst

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## ABSTRACT

One of the main drawbacks of producing biodiesel is that its production costs are comparatively higher than those of petroleum fuel. Eggshell is poultry waste that can be utilized to produce biodiesel at a low cost as a heterogeneous catalyst. The present study was mainly focused on the production of biodiesel from indigenous Millettia ferruginea seed oil using synthesized eggshell-derived CaO. The prepared catalyst was characterized by X-ray diffraction (XRD) and Fourier transform infrared spectroscopy (FTIR) analysis. Methanol was used as an alcohol for the transesterification reaction. The factors affecting the oil extraction, extraction time, kernel size, solvent-to-solid ratio, and extraction temperature) were optimized via the parametric study. The response surface methodology (RSM) based on central composite design (CCD) was used to optimize various process parameters during transesterification reactions. The optimum temperature, catalyst concentration, and methanol to oil molar ratio to achieve maximum biodiesel production of 97.2 wt.% were 63.3 $^{o}$C, 4.06 wt %, and 11:1, respectively. Moreover, the functional groups, purity, and chemical content and fatty acid composition of the extracted oil and produced biodiesel were determined by FTIR, NMR, and GC–MS analysis. From the 1H-NMR analysis. Thus, the application of waste chicken eggshells in catalyst preparation for biodiesel production is cost-effective and environmentally friendly.

## Keyword

Calcium oxide; eggshells; Millettia ferruginea; biodiesel; transesterification

**ICIRIST-ERP-087**

# FABRICATION OF COOLING CHANNEL USING ADDITIVE MANUFACTURING

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## ABSTRACT

Rocket nozzles play a significant role in the propulsion of space vehicles, and the efficient dissipation of heat generated during operation is vital for their performance and safety. This study explores the utilization of Fused Deposition Modelling (FDM) as an additive manufacturing technique to fabricate cooling channels within rocket nozzles. The results demonstrate the potential of FDM in creating intricate cooling channel structures, enhancing the thermal management of rocket nozzle. This innovation contributes to the advancement of rocket propulsion technology, enabling more efficient and reliable space exploration.

## Key word

Additive manufacturing, FDM, Regenerative cooling, Heat management

**ICIRIST-ERP-088**

# Thermophysical physical properties of hybrid Nano phase change materials for thermal management of electronic devices

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## ABSTRACT

The temperature significantly influences the performance of electronic devices and battery. To ensure the power battery operates within an optimal temperature range, a proficient thermal management system for the electronic devices and battery pack is essential. A commonly employed phase change material, has faced limitations in its applications owing to its low thermal conductivity. In this study, we aim to enhance the thermal conductivity of paraffin by introducing proportions of hybrid nanoparticles of 2%. The hybrid nanomaterials used in this study is Antimony tin oxide and Titanium dioxide. Enhancement in thermal conductivity is found to be 87.5% respectively. The XRD and SEM results of materials used in this study were reported. The phase change temperature and enthalpy of 2% nano hybrid PCM is found to be 55°C and 126 J/g, which is suitable for thermal management of electronics.

**ICIRIST-ERP-089**

# Enhanced Porous Osmotic Pump-Based Controlled Release System for Mangiferin: Formulation and Characterization

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## ABSTRACT

This study presents advancements in a porous osmotic pump-based controlled release system designed to enhance the sustained release of mangiferin (MF). The porous osmotic pump consists of water-soluble compounds that create pores within the coated membrane upon contact with water, resulting in an in-situ micro-porous structure. Interestingly, the correlation between MF release and membrane weight advantage shifted from inverse to direct correlation with the amount of polyethylene glycol, a pore-forming substance, within the membrane. The controlled porosity tablet exhibited a zero-order release rate for MF over 20 h. Furthermore, the influence of pH on drug release was investigated. Stability tests, conducted in accordance with International Convention on Harmonization (ICH) guidelines, demonstrated that the optimized formulations remained stable over a three-month period. This research contributes to the development of an innovative controlled release system for MF, showcasing its potential for sustained and controlled drug delivery, with implications for broader applications in pharmaceutical sciences.

## Keyword

Controlled porosity osmotic pump tablets, Mangiferin, Zero order, stability studies.

**ICIRIST-ERP-090**

# Noscapine: A promising anticancer agent with a unique mechanism and noble therapeutic potential

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## ABSTRACT

Noscapine, a natural alkaloid derived from the opium poppy plant (Papaver somniferum), has garnered significant attention in recent years due to its promising potential as an anticancer agentUnlike traditional microtubule-targeting agents like taxanes or vinca alkaloids, noscapine does not interfere with microtubule polymerisation or depolymerisation. Instead, it stabilises microtubules, leading to mitotic arrest and apoptosis in cancer cells. Numerous in vitro and in vivo studies have demonstrated noscapine efficacy against various cancer types, including breast, lung, ovarian, prostate, and pancreatic cancers. It has been shown to inhibit cell proliferation, induce apoptosis, and suppress angiogenesis and metastasis. Additionally, noscapine exhibits minimal toxicity to normal, non-cancerous cells, making it a promising candidate for cancer therapy. The trials have primarily focused on evaluating noscapine's role as an adjuvant therapy in combination with other chemotherapeutic agents, highlighting its potential to enhance treatment outcomes while minimising side effects. Noscapine multifaceted mode of action, including its anti-inflammatory and antiangiogenic properties, positions it as a versatile candidate for cancer treatment. Moreover, its low toxicity profile and oral bioavailability make it an attractive option for long-term cancer management.

## Keyword

Noscapine, Anti-cancer, Bioavailability

**ICIRIST-ERP-091**

# STUDIES ON REMOVAL OF WASTE FROM PHARMACEUTICAL INDUSTRIES

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## ABSTRACT

Incomplete removal of pharmaceuticals during wastewater treatment can result in their discharge into the aquatic environment. The discharge of pharmaceuticals in wastewater treatment plant (WWTP) effluents into rivers, lakes and the oceans has led to detectable concentrations of pharmaceuticals in the aquatic environment in many countries. However, to date studies of WWTP discharges into the aquatic environment have largely been confined to areas of relatively high population density, industrial activity or systems impacted on by such areas. Widespread detection of waste pharmaceuticals in environmental samples and the risks associated with their introduction into wildlife habitats is becoming an important issue for both regulators and the pharmaceutical industry. Many types of pharmaceutical substances have been detected with significant concentrations through various advanced instrumental techniques in surface water, subsurface water, ground water, domestic waste water, municipal waste water and industrial effluents. As a result, pharmaceutical companies are producing different types of pharmaceutical products at large scale and also producing complex non-biodegradable toxic wastes byproducts and releasing untreated or partially treated wastes in the environment in absence of strong regulations. These waste pollutants are contaminating all types of drinking water sources. The treatment of pharmaceutical wastewater was performed. Objective of the laboratory investigation was to study the removal of color, Total Dissolved Solids (TDS), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD) , turbidity and phenol and bring them up to the allowable limits for reuse purposes. Alum was found to be more effective among tested coagulants and reduce TSS, BOD, COD and turbidity 79.6%, 74.8, 88.6% and 79.2% respectively.

## Keyword

Pharmaceutical wastewater, advanced oxidation, Advanced Oxidative Degradation Processes (AOPs), Powerful oxidizing reagents –H2O2, Effluent Treatment

**ICIRIST-ERP-092**

# INVESTIGATION OF MOLASSES TREATMENT PLANT HEAT EXCHANGER SCALE FORMATION AND SCALE FORMATION REDUCTION OPTIMIZATION: THE CASE OF THE SUGAR FACTORY ETHANOL PLANT

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## ABSTRACT

Industrial heat exchanger fouling has financial repercussions. Investigations were conducted on the scale deposit, including inorganic and organic compounds or ions that were obtained from the heat transfer units of the ethanol plant at the sugar industry. According to physical observation, the scale on the heat exchanger surface is the outcome of crystallization. For the molasses preheater, molasses heater, reboilers, and distillation column, respectively, the scales were firm and had an average thickness of 1.46 ± 0.17 cm, 1.86 ± 0.14 cm, 2.24 ± 0.18 cm and 2.40 ± 0.22 cm. This demonstrates that precipitation fouling is the kind of fouling that develops within the plant. Compared to the 1.5 wt.% permitted level of CaO content in cane molasses, the molasses produced by the sugar factory has an average CaO value of 2.24 wt.%, necessitating molasses treatment. Currently, even though the FSF molasses had now passed through all the treatment stages, there was a significant scale buildup on the heat transfer units' surfaces. As a result, the investigation conducted in this work exhibited that modified thermal, and chemical, and acidic centrifugation treatments of molasses are preferred and recommended as compared to the existing molasses treatment method used in the FSF ethanol plant. The modified thermal and chemical treatment experimental analysis achieved 57.87 ± 0.78 wt. % of CaO removal efficiency with 1.04 wt. % CaO content in molasses, and it was low as compared to the 1.5 wt. % acceptable level of CaO content in molasses at the optimum process conditions of 100 $^{o}$C, 4 pH and 50$^{o}$ brix. However, at the optimum process conditions of 100 $^{o}$C, 4 pH, and 50$^{o}$ Brix, the existing treatment process CaO removal efficiency was around 32.14 wt.% with 1.52 wt.% CaO content in molasses. It was above the acceptable level of CaO content in molasses of 1.5 wt.%. Acidic centrifugation treatment was also recommended for the further removal of CaO and other scale-forming components.

**Keywords**

Molasses; fouling; crystallization; heat exchanger; thermal, chemical, distillation; acidic centrifugation

**ICIRIST-ERP-093**

# ENERGY GENERATION BY USING MICROBIAL FUEL CELL WITH BIOCHAR DERIVED ELECTRODES

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## ABSTRACT

Microbial fuel cells (MFC) are bio-electrochemical devices that converts chemical energy of organic compounds to electrical energy or bio-electrical energy through the microbial catalytic reaction at the anode. It consists of anode, cathode, electrolyte, proton exchange membrane.At the anode; the microbes or microorganisms oxidize the fuel/substrate to generate protons, electrons, and CO2. While the protons are moved to the cathode chamber through the exchange membrane.The electrons are transferred from anode chamber to cathode chamber employing an external electrical circuit to generate electrical energy .The main objective of this research work is to reduce the cost of the electrode and to increase the energy production. The electrodes were prepared from cashew nut shell and the physical, chemical properties were characterized. The coconut water is used as the electrolyte since it has some naturally occurring ions and supports the growth of micro-organisms. The cashew nut shell were collected and carbonized at 700 0C. The resulted activated carbon was used to fabricate the electrodes. It has the environmental application in water treatment and purification. The effective carbonization of activated carbon was investigated by using scanned electron microscopy.electrochemical measurements were performed using cyclic voltammetry. XRD was used to investigate the nature of the sample.

## Keywords

MFC, Bioenergy, biochar electrodes, effluent treatment

**ICIRIST-ERP-094**

# TREATMENT OF WASTE STREAMS FROM PHARMACEUTICAL INDUSTRIES USING NANOMATERIAL DOPED POLYSULFONE MEMBRANE

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## ABSTRACT

Polysulfone membrane have gained significant traction in separation technology due to their flexible nature and extensive applications in ultrafiltration and microfiltration membranes. While these membranes are widely accepted across industries, their inherent advantages are accompanied by notable disadvantages such as inadequate hydrophilicity, limited water flux, and suboptimal morphological properties. In response to these challenges, the modification of polysulfone membranes has emerged as a crucial avenue for improvement in these areas. This review aims to comprehensively present and analyse the various modifications undertaken to address the drawbacks associated with polysulfone membranes, with a focus on enhancing mechanical strength, improving water flux, and optimizing morphological properties. By exploring different modification strategies, nanoparticle, and their impacts on membrane performance, this review also seeks to provide valuable insights into the advancements made in polysulfone membrane technology

**Keywords**

Polysulfone, ultrafiltration, microfiltration, water flux, nanoparticles.

**ICIRIST-ERP-095**

# SYNTHESIS OF HETEROATOM DOPED CARBON MATERIALS FROM SOLID WASTE FOR SUPERCAPACITORS

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## ABSTRACT

The growing need for energy storage products has driven the search for sustainable and cost-effective materials for supercapacitor electrodes. Through this study, we represent a novel strategy for synthesis heteroatoms doped carbon materials from a combination of leather waste and biomass, aiming to address both environmental concerns and performance requirements in energy storage applications. Leather waste, a byproduct of the leather industry, and biomass feedstock were carbonized and subjected to a one-pot activation and doping process. The resulting carbon materials exhibited a large surface area with a tailored heteroatoms (nitrogen, sulfur, and phosphorus) content. Comprehensive characterizations, including SEM, TEM, XRD, XPS, and BET analysis were conducted to elucidate the structure and composition of the carbon materials. Electrochemical tests demonstrated superior electrochemical performance, with extraordinary specific capacitance and long-term cycling stability. The unique combination of leather waste and biomass, along with heteroatoms doping, provides a sustainable, cost-effective, and high-performance material for supercapacitor electrodes. This study offers a promising pathway towards the utilization of abundant waste resources in the process of developing energy storage technologies, contributing to a more sustainable and eco-friendly future.

## Keywords

Sustainable, Carbonization, Doping, Cost effective, Electrochemical performance.

**ICIRIST-ERP-096**

# An Investigation into Heat Transfer Within a Plate Heat Exchanger Utilizing a Nanofluid Composed of Therminol-55 and Al2O3

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## ABSTRACT

The plate heat exchanger is one of the compact and most efficient heat exchangers among othertraditional heat exchangers. The aim of this study is to determine how nanoparticles in therminol-55 might improve heat transfer coefficient. The nano fluid is prepared by mixing with therminol-55 and nanoparticle Al2O3 in same proportions ranges from 0.1, 0.25, 0.5 and 0.75 percent. Convective heat transfer and thermophysical characteristics are investigated at constant temperature such as 55°C with varying the flowrate. In this study, we attempted to improve heat transfer studies and the overall performance of a heat exchanger with corrugated plates through making use of Al2O3 nanoparticle in base fluid therminol-55 and then comparing the results to the results of conventional fluids like water and therminol-55 as a cold fluid. Experimental results showed that the addition of Al2O3 nanoparticle increased the heat transfer coefficient of the therminol-55 water system and this enhancement was found to increase with increasing nanoparticle concentration. These findings can have implications for the development of more efficient and sustainable heat transfer systems.

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**Keywords**

Therminol-55, Al2O3 nanoparticle, Heat transfer coefficient, Plate Heat exchanger

**ICIRIST-ERP-097**

# Ag-doped CdS coated cladding-modified fiber optic sensor for detection of NO2 gas

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## ABSTRACT

In this study, a cladding-modified fiber optic sensor is reported for NO2 gas detection. Ag-doped CdS is coated over cladding-removed region of 3cm length by Chemical Bath Deposition (CBD) which acts as the gas-sensing medium. Ag-CdS is coated over four fibers each with a different coating duration of 10, 20, 30 and 40 minutes. Characterisation of Ag-CdS is done by Scanning Electron Microscope (SEM), UV-visible absorption spectroscopy and UV-visible reflectance spectroscopy. The spectral response for different concentrations of NO2 is studied on the four fibers separately, and it is analysed and compared. The results are compared with cladding-modified fiber coated with CdS, which is reported previously. The effect of Ag-doping is analysed.

**ICIRIST-ERP-098**

# TREATMENT OF INDUSTRIAL EFFLUENT USING ANIMAL WASTE

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## ABSTRACT

The major aim of wastewater treatment is removal of as much of suspended matters as possible, before the water is called as effluent. There is lot of heavy metals present in the effluents that became very dangerous problem to the living environment. The effluent contains several heavy metals like chromium (Cr), zinc (Zn), lead (Pb), nickel (Ni) and copper (Cu). In this experiment, a magnetic adsorbent prepared to remove the heavy metals present in the waste water. Here the animal waste is used for the preparation of magnetic adsorbent. The activated carbon was prepared from the animal waste is coated with iron oxides and iron based compounds, that will help to remove the different kind of heavy metals from the effluent. To synthesis magnetic adsorbent by adding ferric chloride (FeCl3) and ferric sulfate (Fe2(SO4)3) and using waste spinach leaves to improve the removal efficiency. In this exploration, the characteristics are analyzed, like elemental composition, the surface structure, porous and non porous morphology. Also determine the crystallographic structure and peak magnitude sites of the activated carbon using techniques like SEM and XRD to study the adsorption capacity, adsorption kinetics and adsorption isotherm using animal waste based magnetic adsorption in different industrial waste water.

## Keywords

Animal waste, metal removal, adsorption, effluent treatment

**ICIRIST-ERP-099**

# Reliable R-Wave Identification in Noisy Holter ECGs with One-Dimensional CNN

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## ABSTRACT

The dependability and precision of R-peak identification algorithms are jeopardized by noisy and poor quality ECG signals from wearable or Holter devices. This work presents a robust and universal method for detecting R-peak in Holter ECG signals. ECG R-peak identification has been successfully tackled by numerous existing methods, yet these detectors' performance on such low-resolution ECG recordings still differs greatly. Methods: In order to reduce the amount of false alarms, a new 1D Convolutional Neural Network (CNN) implementation is utilized in conjunction with a verification model in this study. An encoder block, a corresponding decoder block, and a sample-wise classification layer make up this CNN architecture, which uses the input ECG data to produce a 1D segmentation map of R-peaks. After training, the suggested model can only be used to quickly and accurately identify R-peaks in a single channel ECG data stream; alternatively, this kind of solution can be utilized for real-time monitoring on a small, portable device. Results: The model is tested on two open-source ECG databases: The popular MIT-BIH Arrhythmia Database (MIT-DB) and the China Physiological Signal Challenge (2020) database (CPSC-DB), which contain over a million beats each. According to experimental results, the suggested systematic technique delivers the highest R-peak detection performance ever recorded in CPSC-DB, with a 99.30% F1-score, 99.69% recall, and 98.91% precision. Outcomes also demonstrate comparable or superior performance on MIT-DB with 99.83% F1-score, 99.85% recall, and 99.82% precision compared to the majority of competing techniques. Significance: The suggested strategy can lower false-positives and false-negatives in Holter ECG signals by more than 54% and 82%, respectively, in comparison to all competing methods. In conclusion, the method is highly general and can be applied to any ECG dataset due to the parameters' simple and invariant nature.

## Keywords

1D Convolutional Neural Network, R-peak detection, ECG monitoring, Holter registers

**ICIRIST-ERP-100**

# REAL TIME ANALYSIS ON THE CONTROL OF REVERSE OSMOSIS SYSTEM USING PID CONTROL MECHANISM

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## ABSTRACT

The Reverse Osmosis (RO) process is widely used for water treatment and purification due to its effectiveness in removing impurities and producing high-quality water. Implementing PID control in a Reverse Osmosis (RO) process involves using a PID controller to regulate key parameters such as pressure, flow rate, and concentration to ensure optimal performance and water quality. By applying PID control to an RO process, you can enhance the system's efficiency, maintain stable operating conditions, and achieve the desired water quality. Keep in mind that tuning PID controllers may require some trial and error, and it's important to consider the specific characteristics of the RO system being controlled.

## Keywords

Reverse osmosis, purification, PID control strategy, time domain analysis, error estimation, etc.

**ICIRIST-ERP-101**

# ALLMANIA NODIFLORA LEAF EXTRACT MEDIATED SILVER NANOPARTICLES IMPREGNATED NANOCOMPOSITE FILM FOR FOOD PACKAGING APPLICATIONS

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## ABSTRACT

In order to be used in food packaging, the study aims to develop a composite film based on microcrystalline cellulose (MCC) and coated with silver nanoparticles (AgNPs). The MCC was derived from sugar cane bagasse. Protein, starch, and poly-ethylene glycol 1500 (PEG-1500) are employed to improve the tensile strength, flexibility, and durability of the packaging film. The AgNPs was synthesized by a green route employing Allmania Nodiflora leaf extract as reducing agent. The determined average crystallite size of AgNPs was seen at 20 nm. The X-ray diffraction (XRD) studies of the final film prepared have an elevated peak with a crystallinity of 37.5%. The scanning electron microscopic images (SEM) of the AgNPs and the prepared samples, reveal their surface morphology. The Fourier transform infrared spectroscopic studies (FT-IR) disclose the functional group changes during the film preparation. The antibacterial activity of the amalgamated AgNPs against five bacterial pathogens studied was found to be highly active against tested food pathogens like Salmonella Typhi and Staphylococcus Aureus. When coated over a vegetable, the produced nanocomposite film displayed an increased shelf life for the vegetable by limiting the decay impact caused by food pathogens. According to the findings, the AgNPs-impregnated MCC has the potential to be employed as an antimicrobial packaging material.

**Keywords**

Green Synthesis Silver nanoparticles, Nanocomposite film, Antibacterial activity.

**ICIRIST-ERP-102**

# A PROFILED SIDE CHANNEL ATTACK MODEL FOR SYMMETRIC BLOCK CIPHER BASED ON RESIDUAL FEATURE LEARNING AND EXTREME GRADIENT BOOSTING

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## ABSTRACT

In the field of Cryptanalysis, Side-Channel Analysis (SCA), has been gained more for its vulnerability and ease of implementation. It diverse from typical cryptanalytic practice, her block cipher is considered as a black0box where crypto expert only identify plain text and cipher texts. In SCA, the attacker can identify not only the input and output of block cipher but also get certain side information such as power, time and fault, hence the SCA is also considered as a gray - box model. By using these side information, they can crack the key of ciphers more simply than black-box model.Recent times, the side channel analysis gained benefits from Artificial Intelligence technologies such as machine learning and deep learning to simplify the complicated task of vulnerability assessments for block ciphers. In this work, a deep learning-based cross-device profiled side channel attack model is developed for symmetric AES-128 cipher. The proposed deep learning model is the combination of one dimensional Deep Residual Neural Network(DRNN) and eXtreme Gradient Boosting(XG Boost) for side channel analysis. This proposed model consists of an input layer, a deep feature learning layers (residual blocks), and a pooling layer for middle level feature extraction. The extracted features are finally fed into the XGBoost model for Classification. The power traces captured from multiple Atmega microcontroller devices running AES-128 used for profiling and testing the side channel attacks. The proposed model will be implemented in Python platform and performance will be evaluated using accuracy based on different training scenarios and devices.

**ICIRIST-ERP-103**

# IMAGE SUPER RESOLUTION PRESERVING USING AN EFFICIENT NEURAL NETWORK

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## ABSTRACT

A novel residual deep neural network called SuperNet approach that converts a low-resolution image to a high-resolution image by providing more advanced features for better characterization of images is introduced in this work. Furthermore, the proposed framework reduces the complexity of the network without content loss of the original image. However, the large variations due to blurring in clothing images appearances and styles and their complicated formation conditions make the problem challenging. Low resolution images, such as photographs, may appear blurry or distinct and have fewer pixels, higher compression, or both. The blur may be caused by several external effects such as relative camera-scene motion, camera lens. Thus the large amount of image content is missing in low resolution (LR) images. Super Resolution (SR) is a technique which is used to generate high resolution image with good perceptual quality from low resolution image, thereby increasing the high frequency components and removing the degradations caused by the imaging method of the low resolution camera. So this model introduce a novel approach to convert a low resolution image to high resolution image by using novel residual deep network called SuperNet and resultant image is passed through an efficient model that provides more advanced features for better characterization of deblurred images. The proposed framework focuses on reducing the complexity of the network, increasing the visual quality of the image without content loss of the original image

**ICIRIST-ERP-104**

# Design and Optimization of a Vivaldi Antenna Using Genetic Algorithm for GSM Applications

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## ABSTRACT

This paper mainly involves the application of Genetic Algorithm in Vivaldi antenna design for global system in mobile communication at 1.8 GHz. The proposed design was built on an FR4 substrate with a dielectric constant (k) of 4.4 and loss tangent is 0.002 at 1800 MHz. The initial design uses genetic algorithm to optimize the return loss characteristics and gain performance using multi-objective function through a HFSS-MATLAB interfaces. Finally, the results found in tournament selection, rank based selection and roulette wheel selection were compared for fast optimization.

## Keywords

Vivaldi antenna, GSM, Genetic Algorithm, tournament selection, rank based selection and roulette wheel selection.

**ICIRIST-ERP-105**

# EFFECT OF WELDING PROCESS PARAMETERS ON SURFACE TOPOGRAPHY AND MECHANICAL PROPERTIES OF FRICTION-STIR-WELDED AA2024 & AA209

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## ABSTRACT

The joining of two material with different chemical composition was a major setback for conventional methods of metal joining. The results of this welding were showing considerably great improvement in the aspects of quality of weld, amount of heat generated, uniform distribution of material, refined microstructure, enhanced tribology, materials flowing pattern, good strength with reduced internal stresses. Optimized parameters were estimated by using Desirabilty approach and Response surface methodology. Optimum parameter combination for dissimilar material welding was observed to be 913.74 rpm, 45 mm/min and 8kN. The desirability values for dissimilar welding process were 0.912 respectively. The grain enhancements were decreased in the range of WC> WT> HAZ> Parent material. The wear rate of dissimilar AA2024 and AA2099 were superior as the wear value increases from 0 to 50µm in the nugget zone. The coefficient of friction value remains constant throughout the wear experiment ranges from 0.3 to 0.55. Steady state friction values of 3N to 5N is observed when sliding distance increases. The wear loss was measured by finding the difference between initial weight and final weight and found as in the range from 0.2283 g to 0.4866 g.

## Keywords

Friction stir welding (FSW); Welding Speed (WS), Traverse Speed (TS), Axial Load (AL), metallurgical characteristics, mechanical behavior.

**ICIRIST-ERP-106**

# SYNTHESIS OF CARBON MATERIALS FROM LAMB BONES FOR HIGH-PERFORMANCE SUPERCAPACITORS VIA CHEMICAL VAPOUR DEPOSITION (CVD)

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## ABSTRACT

As the demand for sustainable energy storage solutions grows, researchers are exploring technologies, including supercapacitors. With their ability to store and release energy quickly, supercapacitors play a role in applications such as portable electronics, electric vehicles, and renewable energy systems. To improve their performance and sustainability this study investigates a method of synthesizing carbon materials derived from lamb bones for supercapacitor electrodes. This research focuses on producing carbon materials from sustainable lamb bones. The process involves carbonization of the bones followed by activation to create carbon structures with a surface area. The experimental methodology employed in this study involves optimizing the carbonization and activation processes to achieve the desired characteristics of the carbon materials. Various analytical techniques, including scanning electron microscopy (SEM), X-ray diffraction (XRD), and electrochemical testing, are utilized to investigate the microstructure and electrochemical performance of the synthesized materials. The results of these experiments demonstrate the potential of lamb bone-derived carbon materials for high-performance supercapacitors. In conclusion using lamb bones as a precursor for creating carbon materials shows potential, in developing high-performance supercapacitors. This research contributes to efforts to improve energy storage capabilities while promoting sustainability through renewable resources. The results of this study could have an impact, on the development of supercapacitor technology and the overall objective of attaining more effective energy storage solutions.

## Keywords

Supercapacitors, Carbon vapor deposition, Carbonization, lamb bone

**ICIRIST-ERP-107**

# DESIGN AND FABRICATION OF MICROWAVE PYROLYZER FOR THE PYROLYSIS OF WOODY AND PLASTIC MIXED FEEDSTOCK

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## ABSTRACT

The design and fabrication of a microwave pyrolyzer for processing mixed feedstock of wood and plastic is the focus of this project report. The increasing concern for environmental sustainability has prompted the development of innovative technologies for the efficient conversion of biomass and plastics into valuable resources. This project aims to address this need by creating a versatile and eco-friendly system capable of transforming a combination of wood and plastic waste into valuable products. The microwave pyrolysis process is well-suited for this purpose, as it can efficiently break down the organic materials in wood and plastic, resulting in the generation of valuable bio char, syngas, and liquid bio-oil. The key design elements include a microwave heating chamber, feedstock handling system, and a product collection and separation unit. By optimizing the system's design, the project seeks to achieve maximum pyrolysis efficiency, reduced energy consumption, and minimal environmental impact. The project's fabrication process involves the construction of a prototype microwave pyrolyzer with robust materials and precise manufacturing techniques. The system will be rigorously tested to evaluate its performance, energy efficiency, and emissions. Moreover, it will be equipped with advanced control systems to ensure safe and reliable operation. The outcomes of this project have the potential to significantly contribute to sustainable energy production and waste management.

## Keywords

Microwave Pyrolyzer, Mixed Feedstock, Wood, Plastic, Sustainable Energy, Design, Fabrication

**ICIRIST-ERP-108**

# SEPARATION OF WATER FROM BIODIESEL-DIESEL USING POLYHYDROGEL

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## ABSTRACT

In this work, hydrogel of 2-Acrylamido2-methylpropane sulfonic acid Co-polymer with itaconic acid (AMPS-Co-IA) was obtained by free radical polymerization of 2-Acrylamido2-methylpropane sulfonic acid with itaconic acid in the presence of N, N'-methylene bisacrylamide (MBAAm), in aqueous media. The hydrogels were cut and dried before to be used in saturated fuels. Saturated blends of biodiesel and diesel were mixed in appropriate amounts to form B0 (0% biodiesel and 100% diesel by volume), B20, B40, B60 and B100. A large study was done to synthesize an absorbing material to have appropriated characteristics to be used as water absorbing of fuel samples. The most suitable material must present high swelling ratio combined with an enough density of cross-linked structure that enables handling the material. The dried hydrogels were added to the saturated biodiesel, diesel and blends. The reductions of water content for B20, B60 and B100 were 58, 57 and 64% respectively, after 180 min of treatment with hydrogel.

## KEYWORDS

Hydrogel, Biodiesel Blends and Water Reduction

**ICIRIST-ERP-109**

# FABRICATION AND CHARACTERISTICS STUDY OF MICROCHANNEL CO2 ABSORBER USING MEA, AMMONIA, AND NANOFLUIDS AS SOLVENTS

**Hariharan J, Ramakrishnan K**

## ABSTRACT

This study explores the absorption of carbon dioxide (CO2) within a microchannel column setup, employing mono-ethanolamine (MEA), ammonia, and nanofluids – specifically, graphene oxide – at various concentrations. The research investigates the absorption process under a range of operating conditions, encompassing variations in temperature, solvent and gas flow rates, solvent concentration, and tube diameter. The microchannel column setup, a pivotal component of this investigation, was meticulously constructed using borosilicate glass with diameters of 2 mm and 1 mm. This assembly was securely mounted on a wooden frame, facilitating controlled experimentation and precise data collection. In pursuit of comprehensive insights, the study delves into the dynamics of CO2 absorption within this microchannel system. Parameters such as temperature, solvent flow rate, and solvent concentration were systematically varied to gauge their impact on the absorption efficiency. The influence of tube diameter, a significant structural variable, was also assessed in terms of its effect on mass transfer. The findings from this research carry significant implications, especially in the context of carbon capture technologies and related industrial applications. This study contributes to the expanding body of knowledge in the domain of microchannel-based absorption systems, providing valuable insights for future research endeavors.

**ICIRIST-ERP-110**

# CHARACTERIZATION AND PROPERTIES OF NATURAL FIBER HYBRID COMPOSITES

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## ABSTRACT

Natural fiber is a type of renewable sources and a new generation of reinforcements and supplements for polymer based materials. The development of natural fiber composite materials or ecofriendly composites has been a hot topic recently due to the increasing environmental awareness. Natural fibers are one such proficient material which replaces the synthetic materials and its related products for the less weight and energy conservation applications. Azizatul Karimah et.al.,(2021) Understanding the basic properties of natural fibers is important to determine the optimal intended uses for instance as high-quality bio-composite raw material. Higher cellulose content and crystallinity tend to result better strength properties of fiber while lignin is since versa.Benin et.al(2020) reviewed the various types of natural fibres which could be potentially exploited for the fabrication of polymer matrix composites. The physical properties and extraction techniques of the natural fibres such as kenaf, hemp, sisal, ramie, pineapple, coconut, cotton, and bamboo fibers were explained. The Main objective of my research is to find out the Properties and characterization on natural fiber hybrid composite material for enhancing wide range of applications.Natural fiber composites are best in replacing traditional synthetic fiber composites. The nanocomposite concept has been considered to be an exciting route for creating new and innovative materials with improved performance properties to achieve a continuing demand for the advancing rubber and plastic manufacturing industries. The major applications of bionano composites as adsorbent materials for the removal of emerging organic and inorganic pollutants from water.Bio-nanocomposites have good mechanical properties, biocompatibility and biodegradability. Bio-nanocomposites can be utilized in biomedical applications, such as in drug delivery system, vaccination, wound dressings and tissue engineering.The proposed research is to find the new natural fiber hybrid composites and study the characterization and properties of natural fiber hybrid composite, and to adopt the natural fiber hybrid composites in real time applications.

# Research Project Presentations– II

**ICIRIST-IRP-001**

# Green synthesis of ZnO nanoparticles from Calotropis Gigantea leaf extract for removal of synthetic dye

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## ABSTRACT

Nanotechnology is a distinct field of technology that deals with materials that are extremely small in size (1–100 nm). In order to protect the environment, research needs to be done on the usage of affordable adsorbents for dye removal from wastewater. In this exploration, Zinc Oxide (ZnO) nanoparticles were synthesized from Calotropis gigantea leaf extract commonly known as the crown flower or giant milkweed, for the green synthesis of nanoparticles offers several advantages, such as cost-effectiveness, eco-friendliness, and the absence of hazardous chemicals, utilizing zinc nitrate (ZnNO3.6H2O) as a precursor. The synthesized nanoparticles were characterized using energy dispersive X-ray spectroscopy (EDX) and scanning electron microscopy (SEM) analysis.The percentage removal of dye utilizing ZnO nanoparticles as adsorbent was examined by varying different process parameters. The consequences of various experimental variables were optimized using Response Surface Methodology (RSM) to achieve the maximum removal efficiency of 78.25 %. The optimum dye concentration, adsorbent dosage and contact time were found to be 50 mg/l, 3 mg/l, 12 hr and the synthesized nanoparticles had a pore size of 46.49 nm.

**Keyword**

Calotropis Gigantea, ZnO nanoparticle, EDX, SEM, RSM.

**ICIRIST-IRP-002**

# SYNTHESIS OF LAYERED NANOCOMPOSITE

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## ABSTRACT

In both synthetic and green processes, we created a conceivable nanocomposite of layered double hydroxide nanoparticles for the removal of water-soluble dyes from wastewater. The composite was synthesized by incorporation of activated carbon from pineapple and banana fruit pits in the layer of nanomaterial. The influence of various adsorption conditions was tested to get pre-eminent conditions using layered nanocomposite-activated carbon as an adsorbent and methylene Blue (MB) dye as a type of water-soluble dye. The composite showed preferable affinity for the removal of MB molecules. The various water-soluble dyes are also used for the study of efficient removal by the nanocomposite. The characterization was done by scanning electron microscopy, diffraction, and energy dispersive x-rays. The concentration of dye was measured using a UV spectrophotometer The effect of dye concentration (0.2, 0.4, 0.6, 0.8, 1 ppm). The increase in dye concentration was observed to enhance adsorption efficiency. The synthesis of layered nanocomposites holds immense promise for revolutionizing environmental remediation efforts.

## Keywords

Layered double hydroxide, activated carbon, nanocomposite, methylene blue, wastewater treatment.

**ICIRIST-IRP-003**

# IMPACT OF DIGITAL BRANDING ON ONLINE CONSUMER BUYING BEHAVIOUR - A STUDY WITH RESPECT TO AMAZON

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## ABSTRACT

Brands these days do not solely rely on offline mediums to cultivate their brand. Brands are leveraging on digital mediums such as websites, social media, mobile apps, digital advertisements, email and the likes, to solidify their online position; allowing a more wholesome experience. Creating a brand perception online takes into account all the possible digital platforms that your customers are actively on. In this paper, an attempt has been made to study the impact of digital branding on online consumer buying behavior with respect to Amazon. The study is based on primary data collected through a structured questionnaire. The sample comprises of 100 respondents who have used Amazon purchasing application or website. The tools used for the purpose of the study are Simple Percentage, Correlation and Regression.

## Keywords

Digital branding, Branding, Brands, Amazon.

**ICIRIST-IRP-004**

# EFFECT OF INJECTION PRESSURE ON PERFORMANCE AND EMISSION CHARACTERISTICS OF COTTONSEED OIL METHYL ESTER IN A DI DIESEL ENGINE

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## ABSTRACT

Because of the growing demand for fossil fuels and the danger they pose to the atmosphere, a range of renewable energy sources has been explored worldwide. A high cottonseed oil methyl ester was investigated in a constant rpm, Direct injection diesel engine with varying fuel injection pressures in the current study (180, 190, 200, and 210 bar). This research's primary goal is to look into the impact of injection pressures on the engine's output and emissions. According to the test results, the optimum fuel injection pressure is 190 bar with a cottonseed methyl ester. As compared to other injection pressure, the thermal performance is comparable at this optimized pressure. There is a decrease in carbon monoxide and unburned hydrocarbon with a rise in nitrogen oxides. Except for nitrogen oxide emission, cottonseed methyl ester at 190 bar injection pressure is more effective than 180, 200, and 210 bar.

ICIRIST-IRP-005

# Time Series Forecasting and Modeling of Food Demand Supply Chain

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## ABSTRACT

Accurate demand forecasting has become extremely important, particularly in the food industry, because many products have a short shelf life, and improper inventory management can result in significant waste and loss for the company. Several machine learning and deep learning techniques recently showed substantial improvements when handling time-dependent data. This paper takes the 'Food Demand Forecasting' dataset released by Genpact, compares the effect of various factors on demand, extracts the characteristic features with possible influence, and proposes a comparative study of seven regressors to forecast the number of orders. In this study, we used Random Forest Regressor, Gradient Boosting Regressor (GBR), Light Gradient Boosting Machine Regressor (LightGBM), Extreme Gradient Boosting Regressor (XGBoost), Cat Boost Regressor, Long Short-Term Memory (LSTM), Bidirectional LSTM (BiLSTM) in particular. The results demonstrate the potential of deep learning models in forecasting and highlight the superiority of LSTM over other algorithms. The Root Mean Squared Log Error (RMSLE), Root Mean Square Error (RMSE), Mean Average Percentage Error (MAPE), and Mean Average Error (MAE) reach 0.28, 18.83, 6.56%, and 14.18, respectively.

**Keywords**

LightGBM, BiLSTM, XGBoost, RMSE, MAPE

**ICIRIST-IRP-006**

# PERFORMANCE ANALYSIS OF HYBRID SOLAR COLLECTOR EMPLOYING MANGANESE OXIDE-WATER BASED NANO FLUID COOLANT

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## ABSTRACT

This research investigates the thermal performance of manganese oxide-water-based nanofluids as a coolant in a hybrid collector. The efficiency of solar PV units decreases with increasing cell temperatures. Only 12% of the solar energy received is converted to electricity, and the remaining part is lost as heat. Water and nanofluids are coolants to maintain PV cell temperatures as low as possible. The research aims to design and develop a hybrid collector with nanofluid as a coolant in the system. The system has been evaluated by electrical, thermal, and overall energy efficiencies. The hybrid collector was examined at two different volume flow rates, 0.5 and 1.0 Liter per minute (LPM), to get optimal system performance. Maximum thermal efficiencies of hybrid collectors were 48.1 % and 53.8 % at the volume flow rates of 0.5 LPM and 1.0 LPM, respectively. The maximum electrical efficiencies of the hybrid collector were 18.32 % and 19.35 % at the volume flow rates of 0.5 LPM and 1.0 LPM, respectively. These findings indicate that nanofluid offers better thermal conductivity than the base fluid, with a very small increase in fluid flow rate.

**ICIRIST-IRP-007**

# SYNTHESIS OF ZINC CHLORIDE NANO COMPOSITE FOR DYE REMOVAL

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## ABSTRACT

Pollutants such as dyes, pharmaceuticals and phenolic compounds which can cause toxic effects to human health has significant problem of the environment is the effluent dyes from the textile industry which mixed with ponds, rivers, oceans and cause water pollution. Metal and metal oxides nano composite are commonly used for removing pollutants in wastewater treatment. Metal oxides has unique properties in adsorption behaviors, high chemical stability, radiation absorption and photostability. There are number of metal oxides salts used in pollutants removal such as titanium oxides, graphene oxides, zinc oxides. Among these oxide salts, zinc oxide has the highest efficiency. There are number of zinc salts used in pollutants treatment such as zinc acetate, zinc chloride, zinc nitrate, zinc sulphate to compare this zinc acetate dihydrate has higher yield. Although zinc oxide nano particle has the highest dye degrading efficiency, it solves in water and causes toxicity. To overcome this problem, we combine a polymer with zinc oxide to produce a nano composite which has same dye degradation efficiency and insoluble in water which gives the composite higher stability. Due to its insoluble in nature, the nano composite can be recovered and regenerated for further use. In this paper, the synthesis of nanocomposites was done and characterized using FTIR, UV, XRD, SEM, TEM. This composite is subjected to dye degradation and the efficiency was analyzed.

## Keywords

Zinc oxide, zinc chloride, nano composite, dye degradation

**ICIRIST-IRP-008**

# PERFORMANCE IMPROVEMENT OF GPS AIDED AIRDATA NAVIGATION SYSTEM USING KALMAN FILTER

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## ABSTRACT

Air data's are vital to successfully complete an aircraft's mission and are derived from the air surrounding the aircraft. GPS aided Air data navigation system using Kalman filter is proposed for improving the performance of Air data navigation system. The existing air data performance is very poor due to inaccurate data obtained from air data sensors such as pressure sensors, temperature sensors. The standby Gyro and Magnetic Heading Reference System (MHRS) are incorporated in the air data navigation system (ADNS). When the Inertial Navigation system (INS) is failed, The ADNS get parameters like initial latitude, longitude and wind velocity, wind direction, magnetic variation (MV) and complete the aircraft mission. We have to compare the standby heading and INS heading, lag compensator is introduced to reduce the lag in standby heading. Angle of attack sensor provides noise data due to drift, error model is designed. The error rectified data is found better than sensor data. The parameters like true airspeed, pitch, attitude heading, roll, baro altitude, angle of attack are used to find the latitude and longitude of the aircraft. The calculated latitude and longitude from sensor is an error contained and it is compared with INS latitude and longitude without filter. The calculated latitude and longitude is erroroneous. Kalman filtering is used and the input states such as pitch, standby heading, roll, velocities (north, east, vertical) are estimated. Kalman filter estimated Latitude and Longitude are compared with the GPS data, the result observed was excellent.

**Keywords**

INS, GPS, Kalman filter, Air data sensors.

ICIRIST-IRP-009

# Flux Cored Arc Welding Parameter Optimization of AISI 316L (N) Austenitic Stainless Steel

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## ABSTRACT

Bead-on-plate welds were carried out on AISI 316L (N) austenitic stainless steel (ASS) using flux cored arc welding (FCAW) process. The bead on plates weld was conducted as per $L_{25}$ orthogonal array. In this paper, the weld bead geometry such as depth of penetration (DOP), bead width (BW) and weld reinforcement (R) of AISI 316L (N) ASS are investigated. Taguchi approach is used as statistical design of experiment (DOE) technique for optimizing the selected welding input parameters. Grey relational analysis and desirability approach are applied to optimize the input parameters considering multiple output variables simultaneously. Confirmation experiment has also been conducted to validate the optimized parameters.

**Keywords**

bead-on-plate welding, bead profiles, desirability approach, grey relational analysis

ICIRIST-IRP-010

# Investigation of Magnesium Metal Matrix Composites Reinforced with Steatite: Mechanical and Tribological Properties

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## ABSTRACT

A magnesium metal matrix composite (MMC) is a promising technology for the development of lightweight structural materials with enhanced mechanical and tribological properties that can improve the performance of aircraft. The purpose of this research is to synthesize, characterize, and evaluate magnesium-based composites reinforced with steatite, a mineral of significant thermal stability and hardness. A powder metallurgy process was used to manufacture the composites. In this process, different weight percentages of steatite were homogeneously dispersed throughout the magnesium matrix. SEM microstructural analysis revealed that steatite particles were well-dispersed and uniformly distributed within the magnesium matrix. In order to confirm that the composites contain the specified elements, energy-dispersive X-ray spectroscopy (EDS) was utilized. The study aims to understand the influence of steatite reinforcement on the mechanical strength, wear resistance, and thermal performance of the resulting magnesium composites.

## Keywords

Magnesium metal matrix composites, Mechanical properties, Tribology

**ICIRIST-IRP-011**

# FLOOD INUNDATION MAPPING AND PREPARATION OF EMERGENCY ACTION PLAN FOR VAIGAI DAM

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## ABSTRACT

Dams play a very vital role in the economy of a country by providing essential benefits like irrigation, hydropower, drinking water, recreation etc. However, in the unlikely and rare event of their failure, these may cause catastrophic flooding in the downstream area which may result in huge loss of human life and property. This study focuses on dam break analysis for flood failure and non-flood failure. In this study, Vaigai dam is chosen among the 66 dams in Tamil Nadu which is considered under Dam Rehabilitation and Improvement Project. Flood modelling is carried out for the Probable Maximum Flood. PMP estimates are carried out for 30 years of rainfall data and the PMP estimate found out was 375mm which is used to extract PMF hydrograph done with the help of HEC-HMS model. Dam breach parameters are calculated using Froelich equations and breach width and formation time found out was 577m and 0.3hrs. Two-dimensional flood modelling was performed using GeoHECRAS software. PMF hydrograph with peak outflow value of 2478 m3/s was used as boundary condition for reservoir and manning's value of 0.0019 was adopted. Unsteady flow analysis was performed for overtopping failure and piping failure. Results from the failure show that maximum depth occurs at the channel for about 22m and upto 10m in the floodplains. The velocity profile of the flood reaches a maximum of 13.5m/s closer to the breach and gradually reduces. Flood wave takes about 1hr to reach 48kms. The inundation maps were used to identify the critical areas. Vulnerable areas identified were Melmangalam and Srirangapur reaching inundation depth of 6m Vegavadiassramam, Anaikaraipatti and Puddur reaching a depth of 4m. Annagarpatty, Pullimancombai and Puaampatti reaching a depth of 3m. An emergency action plan was prepared for evacuation and relief measures, for failure scenarios. Watch condition and failure condition flowchart was prepared which has the necessary details to be followed. Areas with high vulnerability were identified and nearest relief centre and shortest escape routes were prepared.

**Keywords**

Flood inundation HEC-HMS, GeoHECRAS, Probable Maximum Flood and PMP

**ICIRIST-IRP-012**

# CLIMATE CHANGE IMPACT ON WATER AVAILABILITY IN SATHANUR RESERVOIR

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## ABSTRACT

Gradual increases in air temperature and Precipitation resulted in mean annual increase in potential and actual evapotranspiration, Streamflow and decrease in Soil moisture and groundwater recharge. Thus we are in situation to analyse the impact of climate change on Streamflow over past few decades. In the Sathanur Reservoir Catchment, agriculture is the largest consumer of water. Therefore, any appropriates strategies for water savings and more efficient use of water in agriculture would help to manage water scarcity issues in the catchment. So its is necessary to adopt climate change impact assessment in Sathanur Reservoir Catchment. Streamflow Computation by hydrological model and using GIS technique has become increasingly possible, practical and popular. The models are are becoming capable for predicting Streamflow and decision making in watershed management. Soil and Water Assessment Tool (SWAT) has been used to simulate hydrological response to climate change. It is a physically-based, semi-distributed and continuous hydrological model that estimates surface and subsurface flow, erosion, sediment deposition and nutrient movement within the catchment, at a daily time step. The SWAT model is based on the water balance equation in the soil, including processes such as interception, infiltration, surface runoff, evapotranspiration, percolation, lateral flow and groundwater recharge. The HRUs represent percentages of the sub basin area and are not identified spatially within the sub basins that are comprised of unique land cover, soil and management combinations. Streamflow is predicted separately for each HRU of the basin. This increases accuracy and gives a much better physical description of the water balance. From 1990 -2010 Discharge data is taken for Calibration and from 2015-2020 years data are taken for validation. Results shows that increase in Maximum and Minimum Temperature, precipitation and Streamflow under SSP 585 when compared with SSP 245 under both Ec-Earth3 and NorESM2-MM GCM's.

## Keywords

Climate Change, Streamflow, SWAT, SSP, Ec-Earth3, NorESM2-MM and HRUs

**ICIRIST-IRP-013**

# AN EXPERIMENTAL INVESTIGATION ON GROUND GRANULATED BLAST FURNACE SLAG AND BAGASSE ASH INFUSED CEMENT CONCRETE

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## ABSTRACT

Concrete is a mixture of cement, fine aggregate, coarse aggregate and water. Concrete is the building block in modern construction. With the growth in the infrastructure the importance of concrete has increased manifold. Concrete plays a vital role in the development of infrastructure, buildings, industrial structures, bridges and highways etc. This requirement is drawn the attention of investigators to explore new replacements of ingredients of concrete. Replacement of cement with various mineral admixtures has been proven to augment the strength and durability properties of concrete greatly. This paper presents the properties and strength of M 20 grade concrete mixes (M0, M10, M15, M25) and its behavior with the partial replacement of cement by mineral admixtures like sugar cane bagasse ash, ground granulated blast furnace slag (GGBS) in concrete. This usage of GGBS serves as replacement to already depleting conventional building materials and the recent years and also as being a by-product it serves as an Eco Friendly way of utilizing the product without dumping it on ground.

**Keywords**

Cement, Mineral Admixtures, Durability Properties, sugar cane bagasse ash and GGBS.

**ICIRIST-IRP-014**

# EVALUATION OF NUTRITIONAL AND METABOLIC EFFECTS OF JAM PREPARED FROM TROPICAL HERBS

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## ABSTRACT

The Experimental work was conducted in Food processing laboratory entitled with "Evaluation of nutritional and metabolic effects of jam prepared from tropical herbs" was performed to investigate the proximate analysis, sensory evaluation and nutritional analysis of the prepared jam. The standardization of jam was done using hibiscus powder from the range of 97 % to 66 %. Nutritional characteristics such as energy, carbohydrates, moisture, pH, ash, protein, fat, acidity was analyzed. The sensory analysis of jam sample S5 is higher than all other jam samples. The nutrition value is higher in S5 when compared to other four samples. The value of fat, carbohydrates, protein, pH, acidity, moisture and ash < 1.0 %, 39.3 %, 2.0 %, 2.4 %. Fat is similar in all samples. Protein is increasing gradually in the jam samples S1 to S5 from 1.3 % to 2.0 % due to the presence of protein in aloe vera the moisture is increasing from sample S1 to S5. It can be concluded from the study that the value addition of aloe vera with hibiscus jam enhance its sensory value and contains basic nutrient like commercial fruit jams.

**Keywords**

Standardization, Enhance and Hibiscus

ICIRIST-IRP-015

# Internet of Things: Architectures, Protocols, and Challenges in security Issues


## ABSTRACT

In Current scenario, we are using knowingly or unknowingly IoT in each and every aspect of day today life. Humans and machines are connected together by means of IoT in order to enhance the automation of fast cyber world. In general, Internet of Things (IoT) refers to a global, distributed network (or networks) of physical objects that are capable of sensing or acting on their environment, and able to communicate with each other, other machines or computers. These objects are known as Smart device. Such 'smart' device come in a wide range of sizes and capacities, including simple objects with embedded sensors, household Appliances, industrial robots, cars, trains, and wearable objects such as watches, Bracelets or shirts. In this paper, the Architectures, Protocols of IoT are discussed briefly and further the Challenges that are arisen in security system and how to overcome those Issues are listed.



## Keywords

Internet of Things (IoT), RFID, IPv6, Device capabilities, Security, Sensors

**ICIRIST-IRP-016**

# LINEAR UNMIXING OF SATELLITE IMAGES USING PCA, ICA AND VCA

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## ABSTRACT

The mixed pixels are prevalent in satellite images due to high resolution, since the coverage area is about 30 meters per pixel for multispectral images. The unmixing of mixed pixels is essential before doing the classification and map preparation process. The mixing of images is by linear and nonlinear mixing models. The number of endmembers present in the dataset can be identified using scatterplot. The shape of the scatterplot decides the number of endmembers present in the image. Then the purest pixels are given as input using the ROI tool. Then the unmixing is performed using the Principal Component Analysis (PCA), Independent Component Analysis (ICA) and Vertex Component Analysis (VCA). These experiments are conducted on the multispectral datasets and the results of these methods shows that the ICA technique performs better than PCA and VCA techniques.

**Keywords**

Linear Unmixing, Endmember Extraction, Principal Component Analysis, Independent Component Analysis, Vertex Compenent Analysis

ICIRIST-IRP-017

# BREAST CANCER PREDICTION USING SUPERVISED MACHINE LEARNING ALGORITHMS

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## ABSTRACT

Breast Cancer is the most leading malignancy affecting more than 2.1 million women each year, which leads to the greatest number of deaths among women. Early treatment not only helps to cure cancer but also helps in prevention of its recurrence. Hence, this system mainly focuses on the prediction of breast cancer where it uses different machine learning algorithms for creating models like decision tree, logistic regression, random forest that are applied on pre-processed data which suspects greater accuracy for prediction. The experimental results are compared and it is evident that, Random Forest Classification leads to best accuracy with 98.6%.

## Keywords

Decision Tree, Logistic Regression, xgboosting Classification, Numpy, Pandas, Seaborn.

ICIRIST-IRP-018

# MULTIPLE OBJECT DETECTION USING THERMAL IMAGING

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## ABSTRACT

This paper discusses the work on detecting multi-objects such as person and car in thermal image captured during night time using deep learning architecture. Thermal images are superior to the visible images when it comes to the amount of useful information required to detect the objects during night time. Thermal imager uses radiation emitted by the objects to create an image and improve the visibility of objects in a dark environment. Contrast to that, visible image does not provide useful information in darkness. Hence, it is better to use thermal images to detect objectspresent in darkness.The state-of-the-art, Yolo-v3, deep learning convolutional neural network model are the latest version of the Yolo model in which the feature extraction layer contains a much deeper network. The results of detecting person and car in the thermal images obtained by the proposed model are compared with the results of Yolo- v3.Experimental results shows that there is a significant improvement in detecting person and car in the thermal images in terms of mean average precision (mAP) using the proposed method.

## Keywords

Thermal images, Deep learning, Yolo-v3, Neural network, Mean average precision

**ICIRIST-IRP-019**

# SONG RECOMMENDATION SYSTEM USING FACIAL EXPRESSION

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## ABSTRACT

Nowadays many personalized applications were developed based on facial recognition technology and music recommendation systems. This project presents a novel approach that utilizes the facial recognition algorithms to understand users' emotions and recommends the music based on their facial expressions in real-time. Initially the video footages are converted into frames and the images are analyzed to detect the facial expression using computer vision algorithms. Facial recognition techniques such as deep learning-based neural networks are employed for accurate and real-time identification of emotional states. The data set of around 2500 images are given as input in order to train the model. After the training, the real time images are taken and it is compared with the training data set. The images are labelled based on the training using convolutional neural network. The appropriate songs are recommended using the hybrid recommendation system depending on the assigned label. The experiments are conducted and validated using three methods support vector machine (SVM), extreme learning machine (ELM) and convolutional neural network (CNN) and it is observed that the CNN has high accuracy of 95 percent comparatively.

## Keywords

Facial Recognition, Music Recommendation System, Emotion Recognition, Convolutional Neural Network, Machine Learning, Computer Vision.

**ICIRIST-IRP-020**

# SCENTED INNOVATIONS: UNVEILING THE POTENTIAL OF AN ELECTRONIC NOSE FOR VERSATILE ODOR ANALYSIS

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## ABSTRACT

This paragraph highlights the significance of the sense of smell in daily life and its impact on perceptions, behaviors, and health. It introduces the concept of an "electronic nose," a technology born from the integration of science and technology, specifically using sensor arrays to mimic and expand upon the human olfactory system. The focus of the project is the development of an electronic nose utilizing MQ gas sensors and an Arduino Uno microcontroller for discriminating odors. MQ sensors' sensitivity to various gases and vapors makes them versatile for odor analysis. The system, equipped with a sensor array, demonstrates the ability to detect and differentiate a broad spectrum of odors with potential applications in industries such as food, agriculture, and environmental monitoring. Real-time odor data presentation through an LCD display enhances the system's usability. \This project aims to devise and implement an Arduino-based electronic olfaction system capable of discerning specific volatile organic compounds (VOCs) associated with coffee flour, cigarette smoke, LPG, and beer scents. Leveraging MQ series gas sensors, the system endeavors to offer real-time feedback via an LCD display, indicating the presence of the targeted substances. Rigorous calibration procedures will be established to ensure precise and dependable detection, with a primary focus on practical applications in environmental monitoring and safety assessments. The project aspires to propel advancements in gas sensing technologies, showcasing the viability of a cost-effective and adaptable electronic olfaction system applicable across various industrial and research domains.

**Keywords:**

Electronic nose, MQ sensors, odor analysis, volatile organic compounds, etc.

**ICIRIST-IRP-021**

# SMART SLIPPERS FOR WOMEN SAFETY

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## ABSTRACT

The safety of women and children is a major concern in our culture these days. The number of victims keeps rising every day. Numerous regrettable events have been occurring.This paper Proposes a quick responding mechanism that helps women during trouble. This project covers descriptive details about the design and Implementation of "Smart footwear". The device comprises a switch, a Microcontroller (ESP-8266 , ESP-32), and a GPS module. In this projects ,Women Press the switch when they find themselves in dangerous Situations. When the switch is pressed, the GPS system is employed to Determine and share the current location through the Blynk cloud Platform. This ensures real-time location tracking and allows for webpage Updates. Additionally, the device can capture and transmit pictures and Videos to Telegram during emergency situations, serving as a personal Security tool. Its compact size and portability make it an ideal companion For individuals, allowing them to carry it everywhere with ease. This Multifunctional device integrates location tracking, cloud connectivity, And emergency image and video recording, offering a versatile and Practical solution for personal security.

## Keywords

Unsafe, smart footwear, microcontroller, GPS module, switch, Blynk cloud platform, tracking, telegram, emergency image and video, Personal security.

**ICIRIST-IRP-022**

# AUTOMATED RFID – BASED PATIENT HEALTH MONITORING AND REMOTE DATA TRANSMISSION SYSTEM WITH TELEGRAM INTEGRATION

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## ABSTRACT

In light of the spread of the Corona pandemic / infection disease in the world very quickly and for the small number of medical cadres in hospitals and the growing number of terrifying cases and to reduce the contact between the medical cadres and those infected with the Corona virus. We had to manufacture a robot on the form of a special bed to transport the patient this robot does not feel tired and not affected by emotions. This robot is not exposed to the disease. The robot is equipped with an RFID reader, an ESP32 CAM module, and the capability to communicate with a Telegram bot. The robot follows a predefined path, and when it approaches a patient, it reads an RFID card to identify the patient. It then captures an image of the health monitoring instrument's display and updates this data to a Telegram bot. This system aims to provide an efficient and automated method for realtime patient health parameter monitoring and data transmission. In this process, we will not need human intervention and at the same time we protect the lives of medical personnel from the risk of injury with this virus.

Keywords

Health monitoring, ESP32 CAM, Data transmission, Telegram

**ICIRIST-IRP-023**

# CORD-FREE VISION WIZARD

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## ABSTRACT

Blindness, a worldwide health concern that affects millions of people, is prevalent. A lot of underlying factors, including ailments that may be treated and prevented, contribute to this important public health issue. India has one of the largest numbers of persons who are blind. One in three blind persons globally, according to statistics, are Indian. Platinum and iridium are currently used for implants but these metals deteriorates within 5 to 10 years.The wireless vision wizard employs tiny, implanted wireless stimulator modules that can transmit video camera-captured picture data directly to the brain. Each module, known as a wireless floating microelectrode array (WFMA), gets power and digital commands over a wireless connection, so no connectors or cables touch the scalp. A rudimentary visual picture is produced by transmitting orders to the WFMAs, which then transmit camera images directly to the brain. Although these rudimentary sensations won't be exactly like regular vision, they could be beneficial for jobs that require visual guidance.

## Keywords

Blindness, WFMA, wireless stimulator modules, microelectrode.

**ICIRIST-IRP-024**

# AN EXTENSIVE MATLAB-BASED APPROACH FOR EARLY ALZHEIMER'S DETECTION AND MONITORING

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## ABSTRACT

In the present study, we employ deep learning algorithms to offer a novel approach for Alzheimer's disease early diagnosis. Dementia is a devastating neurological disorder that affects millions of lives globally. Early identification is vital to effective treatment. Our approach combines clinical data with massive datasets of diagnostic imaging, including MRI and PET scans, in order and applies machine learning to detect complex anomalies and patterns associated with an illness. Through a systematic analysis of these multimodal databases, our technique may effectively detect potential early indicators of Alzheimer's disease, aiding more precise and timely diagnosis. The application of algorithms based on deep learning in the identification of Alzheimer's condition offers a chance to improve outcomes for patients and further our understanding of the illness by providing early intervention and tailored treatment plans. We provide a new automated method for detecting brain abnormalities associated with Alzheimer's disease (AD) using magnetic resonance imaging (MRI). The MRI is analysed using Multi Scale Analysis (MSA) to identify its fractal forms at six different sizes. A CNN (Convolutional Neural Network) classifier can discriminate among MRI scans of the brain from AD patients and those from healthy brains based on the retrieved fractals as features. The results show that radiologists might find the recommended technique to be a helpful diagnostic aid for AD.

## Keywords

Alzheimer's disease, MRI and PET scans, Multi Scale Analysis, Convolutional Neural Network, diagnostic aid

**ICIRIST-IRP-025**

# ANATOMICAL PLACEMENT OF AN ACCELEROMETER BASED PARALYSED PERSON MONITORING DEVICE USING IoT

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## ABSTRACT

With the huge development and the latest technological advancement in mechatronics, prosthetic devices have acquired interest in many different fields such as medical and industrial fields. A prosthetic device can be an external wearable machine that covers the body or part of it. It is generated by electric motors. It can be installed on and elbow joint. Moreover, it can be used for different purposes such as rehabilitation, power assistance, diagnostics, monitoring, ergonomics, etc. Most of the existing wearable devices face different problems in terms of size, cost and weight; they are huge, expensive and heavy. Therefore, the goal of this project is to design a portable, lightweight and low-cost rehabilitation system for people with a fracture/paralysed based on accelerometer sensor. In this project, we are using IOT (ESP 8266 – 12E NODE MCU) controller to monitor and control the fracture/paralysed hand functionalities. The wearable device allows a user to perform specific movements and exercises to train the patient's impaired hand using IoT communication. Thus, the user gradually starts to restore the functionality of his hand and also alert the care takers/doctor though IoT module based on the hand gesture movement. And the system incorporates an accelerometer fixed to the user's finger, enabling them to communicate their need for help through simple finger movements. When assistance is required, the user can trigger the accelerometer, and a message, such as "I NEED HELP," is displayed on an LCD screen. This technology offers increased independence and a means of communication for individuals with limited mobility.

**ICIRIST-IRP-026**

# Antagonists Specifically Targeting Anti-apoptotic Members of Bcl-2 Family Proteins as evaluated by Computational Methods

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## ABSTRACT

Maintaining cell homeostasis is critical for the proper functioning of higher eukaryotic organisms, where imbalances in cell death and survival mechanisms can lead to neurodegenerative diseases or cancers. Cancers, characterized by uncontrolled cell proliferation and impaired apoptosis, are influenced by genetic and environmental factors. The Bcl-2 family of proteins plays a pivotal role in regulating apoptosis through intrinsic and extrinsic pathways. This study explores the design of small molecular antagonists targeting anti-apoptotic Bcl-2 family proteins such as Bcl-XL, Mcl-1 and Bcl-B using In silico methods. The study highlighted the importance of considering structural differences in the BH3-binding grooves of Bcl-XL and Mcl-1 to achieve specificity in antagonist design. For Bcl-B, a novel computational strategy, the peptidodynmimetic method, was successfully employed. Cumulatively, this study contributes to the development of precise antagonists for anti-apoptotic proteins, offering potential advancements in cancer chemotherapy. The integration of computational methods enriches the comprehension of protein-ligand interactions, thereby guiding the formulation of novel therapeutic strategies with enhanced efficacy.

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ICIRIST-IRP-027

# Detection of Metastable Denatured States in Ubiquitin Under its Native Conditions

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## ABSTRACT

The free energy of unfolding (ΔGU) determined through optical methods and the free energy of exchange (ΔGHX) measured by Nuclear Magnetic Resonance (NMR) assisted hydrogen-deuterium (H/D) exchange methods for ubiquitin at pH 9.2 were found to be 6.2 kcal/mol and 9.5 kcal/mol, respectively. The discrepancy of approximately 3.3 kcal/mol between the ΔGHX and the ΔGU at pH 9.2 could not be entirely explained due to cis-trans proline isomerization in ubiquitin during the transition to the unfolded protein state. The study indicates that this discrepancy could be linked to the presence of metastable denatured states within ubiquitin when analyzing the exchange data under different pH conditions, accounting for both the EX1 and EX2 exchange reactions. These metastable states likely involve a limited range of conformations, transitioning from a transition state to a broader distribution of conformations characteristic of the denatured ground state.

## Keywords

Free Energy, Hydrogen-Deuterium Exchange, Metastable Denatured States, Protein folding and Transition states.

**ICIRIST-IRP-028**

# HAEMATO TOXICITY DETECTION [SEPSIS DETECTION] USING BIOSENSOR

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## ABSTRACT

Sepsis is a potentially fatal infection-related condition. It occurs when the body releases an agent into the bloodstream to combat the infection, triggering inflammation all over the body. This inflammation can cause harm to various organs and may lead to their collapse and failure. According to the 2017 census, sepsis was responsible for the deaths of almost 48.9 million people, which was around 19.7% of the entire population. The serum lactate test is the only method used to diagnose sepsis. This test measures the amount of lactic acid in the blood and is a sensitive and accurate biomarker of tissue hypo-perfusion and hypoxia. Unfortunately, many people are unaware of the potentially fatal sepsis condition. Our project aims to address this issue by combining the sepsis test with a blood test. The project materials include three types of biosensors: the working electrode (WE), reference electrode (RE), and counter electrode (CE). Each electrode must be chemically stable and conductive. Our project idea acts as a simple, non-invasive technique for identifying sepsis. Our technology offers an efficient means of early detection of sepsis, which may lead to a cure.

**Keywords**

Sepsis, Working electrode, Reference electrode, Counter electrode.

ICIRIST-IRP-029

# Needle-Free Injection Systems: Revolutionizing Drug Delivery and Improving Patient Outcomes

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## ABSTRACT

Needle-free injection (NFI) has emerged as a groundbreaking transdermal drug delivery system designed to administer various medications, including antibiotics, iron supplements, and vaccines, without the need for traditional needles. This innovative technology aims to provide a comfortable, accurate, easy, and rapid alternative to conventional needle-based injections, eliminating the discomfort and challenges associated with skin piercing. While hypodermic needles have been widely utilized for intradermal, intramuscular, subcutaneous, and intravenous drug administration, they often lead to issues such as pain, needle phobia, inflammation, scars, and the risk of transmitting contagious diseases. This explores the advantages of needle-free injection systems over traditional needles. NFIs not only offer a more patient-friendly experience by eliminating pain and the fear associated with needles but also address the persistent issues of inflammation and scarring caused by conventional injections. Furthermore, the risk of contagious diseases associated with needle use is significantly reduced with the adoption of NFI technology. Despite the numerous advantages offered by traditional needles, the drawbacks of needle phobia, pain, and needle stick injuries persist. The introduction of needle-free injection systems is anticipated to enhance vaccination rates and decrease reliance on oral medications. By overcoming the limitations of needle-based injections, NFIs have the potential to revolutionize drug delivery practices, ensuring a more seamless and positive experience for both healthcare providers and patients. In conclusion, the adoption of needle-free injection systems represents a significant stride toward improving the overall efficacy and patient experience in drug delivery. As technology continues to advance, it is expected that NFIs will play a crucial role in augmenting vaccination rates and reducing the reliance on oral medications, thereby shaping the future of healthcare delivery.

## Keywords

Needle-free injection, Drug delivery, Healthcare, etc.,

**ICIRIST-IRP-030**

# INCUBATOR FOR PREMATURE BABIES IN RURAL AREAS

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## ABSTRACT

Through this project, we seek to reduce infant mortality rates and promote community awareness about neonatal care. By making incubators accessible in underserved areas, we aim to contribute to equitable healthcare access, ensuring that even the most vulnerable infants have the opportunity to thrive. This abstract highlight the importance of this initiative in enhancing the health and well-being of premature babies born in rural communities. By making incubators accessible in rural areas, we hope to empower these communities to provide essential care to their youngest residents, fostering a healthier and more promising future for premature babies. The system's sustainability is driven by solar panel energy, reducing reliance on conventional power sources. Should solar energy become insufficient, a seamlessly integrated battery backup ensures uninterrupted care. Furthermore, a relay system efficiently manages power distribution between the solar panel and AC source, guaranteeing continuous support for the infant. This integrated approach revolutionizes neonatal care, combining advanced technology with eco-conscious practices, setting a new standard for safety, comfort, and environmental responsibility in healthcare facilities. This abstract underscore the significance of this endeavor in improving the health outcomes of premature infants born in underserved rural areas and emphasizes its potential to drive positive change in healthcare disparities.

## Keywords

Incubator, infant mortality rate, neonatal, premature babies, sustainability, conventional

**ICIRIST-IRP-031**

# SCREENING OF PHYTOPHENOLS FROM CENTELLA ASIATICA & EVALUVATING IT'S FREE RADICAL SCAVENGING, ANTI-INFLAMMATORY POTENCY FOR THE TREATMENT OF HEPATOCELLULAR CARCINOMA

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## ABSTRACT

Plants have been proven to be an exceptional supply of medicine, and lately, recognition for medicinal plant studies has increased. Centella asiatica is widely recognized for its conventional uses and medicinal properties for the treatment of many diseases. The posted literature points out the usage of this plant as complete and bioactive compounds that are widely used in the remedy of diverse human ailments. Centella asiatica said to possess numerous pharmacological activities, including anti-inflammatory activity and antioxidant activity (MTT assay). Centella asiatica is likewise wealthy in flavonoids and terpenoids. Compounds, among them asiatic acid, asiaticoside, and madecassoside, are properly characterized for their pharmacological value. These results suggested that Centella asiatica had hepatoprotective effects by increasing the levels of antioxidant enzymes and reducing the levels of inflammatory mediators in rats with DMN-induced liver injury. Therefore, Centella asiatica may be useful in preventing liver damage.

## Keywords

Hepatocellular carcinoma, Centella asiatica, Antioxidant assay, Anti-inflammatory assay, Asiaticoside.

**ICIRIST-IRP-032**

# GSM BASED INFUSION POLE REPLENISHMENT NOTIFICATION SYSTEM

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## ABSTRACT

The purpose of IV drip monitoring systems is to ensure the safe and effective Delivery of fluids and medications to patients in healthcare Settings, including hospitals, clinics, and home healthcare. Saline, one of the most popular intravenous (IV) therapies plays a major role in the management of patients who are critically ill. In hospitals, the nurses or caretakers are responsible for monitoring the saline bottle level. Mostly, due to negligence and any unusual condition, the exact timing of removing the needle from the patient's vein is ignored which causes a serious casualty and may lead to death as well. Furthermore, remote monitoring is a need to provide telehealth services. To prevent the accident due to the ignorance of caretakers and to provide remote surveillance in telehealth services, we have proposed the cost-effective smart saline level monitoring device which includes the combination of sensor and GSM technologies. We have built this system by using load sensor, flow sensor and ultra-low power low cost Arduino Uno microcontroller. The load sensor converts the weight of the bottle to a specific voltage. And also by using the flow sensor we can detect the flow rate of the IV bag. The GSM generates and publishes a specific message based on the voltage received from the sensor. To publish and present the messages to the registered phone number (doctors, nurses or caretakers) And also alert the through buzzer. Additionally, the IV pole consists of sensors used to monitor the IV bags for the remaining fluid amount.

## Keywords

Intravenous drip monitoring systems, GSM technology, Load sensor, flow sensor, Arduino Uno, buzzer.

**ICIRIST-IRP-033**

# ADVANCING SAFETY MEASURES: ANALYZING NECK DIRECTION FOR ENHANCED SECURITY

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## ABSTRACT

The fast technological progress has contributed to the creation of inventive approaches to improve security and integrity across several fields. Instantaneous behavioral tracking and evaluating using Arduino modules has increased in popularity in the past decade. This study provides a novel approach that uses the flexible UNO version of the Arduino technology to analyze collar movement and increase protection and security. In the present research, we suggest a unique method to improve privacy and security by analyzing collar movement using an ADXL335 acceleration sensor and a UNO version of the Arduino microcontroller. Given the focus on identifying prolonged motions over time, this technique is intended to assess collar movements in particular directions. The direction as well as the extent of Collar movements are recorded & measured using an ADXL335 acceleration sensor. The sensor itself gives precise data on the movement's directions and is highly susceptible to variations in acceleration. The vibrating motors are used to detect movement or vibration. It functions as an alarm procedure, kicking in whenever an accelerometer notices a persistent movement of the Collar in a particular direction. The structure's core processor is an Arduino UNO microcontroller. It collects and analyses information supplied by these devices by integrating with the vibrating actuator and acceleration sensors. The UNO version of the Arduino activates the motor that generates vibration once the accelerometer records an ongoing movement of the neck within the designated position.

## Keywords

Neck, Collar Movement, ADXL335 Acceleration sensor, Arduino, Vibration

**ICIRIST-IRP-034**

# SYNTHESIS OF PLASTIC ANTIBODIES FOR THE EXTRACTION OF ORGANIC POLLUTANTS FROM THE AGRICULTURE WASTE WATER

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## ABSTRACT

Molecularly imprinted polymers (MIP) are considered one of the most promising and novel separation methods for the removal of phenolic compounds in wastewater treatment. MIP is a cross-linked polymeric material that exhibits high binding capacity and selectivity towards a target molecule (template) and is purposely present during the synthesis process. In this work, MIP was prepared in a bulk polymerization method in a ratio of 3:1 acetonitrile and toluene using 2,4-dinitrophenol, acrylic acid, ethylene glycol dimethacrylate (EGDMA), and Azobisisobutyronitrile (AIBN) as templates, functional monomers, cross-linkers, and initiators, respectively. An adsorption process for the removal of 2, 4-dinitrophenol using the fabricated MIP was evaluated under various pH and time conditions. The parameters studied for 2,4-dinitrophenol include adsorption kinetics, adsorption isotherm, and selectivity. The maximum adsorption of dinitrophenyl by the fabricated MIP was 3.33 μM/g. The adsorption of 2,4-dinitrophenol by the fabricated MIP was found effective at pH 7.0. The binding parameters of MIP and non-imprinted polymer (NIP) were compared by the Freundlich and Langmuir adsorption isotherms.

## Keywords

2, 4-dinitrophenol, Molecular Imprinted Polymers, Non-imprinted Polymer (NIP), absorption.

**ICIRIST-IRP-035**

# PROCESS DESIGN AND OPTIMIZATION OF METHYL ETHYL KETONE

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## ABSTRACT

Methyl ethyl ketone (MEK) is a widely used chemical in the industry. Most of the MEK uses are directly related to industrial application; however, recent studies suggest the use of MEK as a possible fuel for spark-ignition engines. The industrial process to produce MEK is performed through the hydration of butylene and the dehydration of that alcohol. Methyl ethyl ketone (MEK) is soluble in water and is commonly used as an industrial solvent. It is a strong degreaser and used to remove resins, adhesives, coatings and other substances from metallic surfaces. MEK is used industrially when a metallic surface requires surface treatment to prevent corrosion. It is used to remove old coatings that may have become eroded or otherwise unsatisfactory. Once the old coating is completely removed, the surface can then be cleaned and a new coating may be applied. It is also used in professional paint shops to thin acrylics and lacquers.MEK is highly volatile and evaporates quickly. It is poisonous so extreme care should be taken when handling, the process of MEK is simulate in Aspen plus software to increase the yield and the purity of the component.

## KEYWORDS

Methyl ethyl Ketone, Aspen Plus, Hydration of butylene

**ICIRIST-IRP-036**

# Cloud point extraction of reactive Congo red and optimization using experimental design

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## ABSTRACT

The exploit of non-ionic surfactants in Cloud Point Extraction (CPE) consists of a twophaseprocess without the presence of an organic solvent. The aim of the present study is tooptimize the removal of Congo red from an aqueous solution using Triton X-114 as non-ionicsurfactant by CPE technique. A three level factorial design and responsesurface methodology were occupied to estimate the effects of operating temperature andsurfactant concentration on CPE process. The effects of these factors on thefollowing parameters were estimated: percentage of Congo red dye extracted, ratio betweenphase volumes and residual amounts of dye in dilute and surfactant rich phase after separation.Mathematical models were urbanized to predict the effect of each variable and theirconnectionswith the extraction parameters. A relationship between predicted values using model equationsand experimental values revealed that the correlation coefficients (R2) were greater than 0.98.The models were validated by analysis of variance, significance, and prediction, allowing theoptimization of process variables. Response surface methodology allows the optimization ofprocess variables. The results showed that 98% removal of Congo red dye using this technique.

## Keywords

Congo red; surfactant; Triton X114; cloud point extraction

**ICIRIST-IRP-037**

# Removal of Congo red dye by stirring assisted cloud point extraction using Triton x-114 as non-ionic surfactant

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**ABSTRACT**

Stirring- assisted cloud point extraction technique (SA-CPE) is developed for the extraction of Congo red dye using Tritonx-114. The SA-CPE method has been demonstrated to be simple, effective and reliable for sample studied. In addition the developed method can be used as an alternative technique to the conventional CPE. The effects of operating parameters such as dye concentration, surfactant concentration and operating temperatures were studied. The experiments are conducted for different set of surfactant and solute concentration ranging from 0.01M to 0.1M and 25ppm, 50ppm and 75ppm respectively. The stirring-assisted cloud point extraction was performed at different temperatures ranging from313.15 K, 323.15 K and 333.15 K. The whole process was able to be finished within 20 minutes. The extraction efficiency, phase separation, distribution coefficient and pre-concentration factor are determined for different operating conditions. The graphical representation of the extraction efficiency using conventional cloud point extraction technique is compared with the stirring-assisted extraction efficiency graph. The stirring-assisted technique offers high recovery.

**Keywords**

Cloud point extraction technique, Stirring-assisted cloud point extraction, Congo red dye, Triton X-114

ICIRIST-IRP-038

# ANALYSIS THE PERFORMANCE, EMISSION AND COMBUSTION OF DIESEL ENGINE POWERED BY – ALGAE METHYL ESTER

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## ABSTRACT

This paper reports on the algae methyl ester is blended with diesel fuel in different percentage and the effects of their performance, combustion and emission characteristics of the DI diesel Engine. In this study, the tested fuels were obtained through transesterification process. The Properties of algae methyl ester (AME) analysed by ASTM standard methods.Experimental results showed that the cetane number and flash points of the algae methyl ester blended diesel Have increased with higher concentration of AME. Based on the experimental results, HC and Smoke emissions noticeably increase, while NOx emissions significantly decrease with Increasing the dosing level of AME. From the results, B25 having nearer values in terms of Combustion and emission to diesel fuel. At the full load, the magnitude of HC, smoke and NOx Emissions for the neat diesel was 110 ppm, 70 HSU and 1130 ppm, whereas it was 116 ppm, 77 HSU and 1060 ppm for the B25 blend of AME fuel, respectively.

**Keywords**
Algae methyl ester, Transesterification, Combustion, emission.

**ICIRIST-IRP-039**

# DECOLORIZATION STUDIES OF SYNTHETIC REACTIVE YELLOW 4 AZO DYE By Rhizopus Oryzae.

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**ABSTRACT**
The synthetic dye (CI Reactive yellow 4) was decolorized by fungal strain Rhizopus Oryzae. The parameter studied during dye decolorization are dye concentration, pH, nitrate and co-substrate (Dextrose, Starch, and Sewage) with effects the decolorization pattern. The decolorization of CI Reactive Yellow 4 are 88% for initial dye concentration of 10mg/lit.. Increase in the concentration decrease the removal percentage. The optimum pH for decolorization was observed and found into the range of 6.6 to 7.8.The co-substrate (Starch) increase the decolorization rate and found to be more efficiency then compared (Dextrose and Sewage). Nitrate shows inhibitory effect in decolorization pattern. Kinetic modeling of dye decolorization was done by substrate inhibition model. The model selected for the substrate inhibition is Levenspiel model and found to be fit well with experimental data. The constant in Levenspiel model was calculated and found to be Km = 15.22, Ki = 85.96 and Vmax = 0.832.
Key words: Azo dye Reactive Yellow Decolorization Effecct of pH, Nitrate, Co-substrate Levenspiel model.

**ICIRIST-IRP-040**

# SYNTHESIS OF NANOADDITIVES FOR ENHANCED PRODUCTION OF BIO-HYTHANE FROM FOOD WASTE


## ABSTRACT

The present study was aimed at examining the biohythane production from institute food waste. Initial process to inject the food waste (FW) and cow dung (CD) into the digester tank. It's followed by the process to digest feed for the (FW+CD) and produce bio-gas mixture. Every day, we checked the value of PH. In a dark fermentation process or anaerobic decomposition process to convert all bio- degradable waste into useful renewable energy called "Bio-gas". At the same time, we checked out the values of operational control parameters (PH, alkalinity, and VFA) and process performance parameters (bio-hydrogen, bio-methane, and other gases).Bio-gas mixtures are quantified by using gas detection sensors, an alternative method for gas chromatography (GC). Finally, these gases were forwarded to the burner. Six months of collected data were stored by the gas detection sensor. Using collected sensor data, statistical data analysis (SDA) concluded the volume of gas production. The main advantages of this study for biohythane production from food waste.

**ICIRIST-IRP-041**

# DEEP EUTECTIC SOLVENT AS ALTERNATIVE GREEN SOLVENT FOR THE EFFICIENT REMOVAL OF BOTH ACIDIC AND NON-ACIDIC POLY PHENOLS FROM CASHEW NUT SHELL LIQUIDS

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## ABSTRACT

The foremost aim of this work is to evaluate the feasibility of the Choline Chloride-based Deep Eutectic Solvents (DESs) for isolation of phenolic Compounds such as cardanol from the Technical Cashew Nut Shell Liquid (Tech.CNSL). The DES used in this process is a mixture of Choline chloride and Monoethanol amine in the molar ratio of 1:2 to 1:8 at 298.15K and atmospheric pressure. Technical CNSL is mixed with DESs of various proportions to obtain cardanol. Isolation efficiency of the cardanol using DES is compared with pure cardanol. As well as conventional method using Isobutyl methyl ketone and ethyl acetate. The composition, Functional group, area percentage, identification of chemical structure, purity of Each component in the extracted cardanol are analyzed using GC-MS, FT-IR, From the results, it is seen that the isolation using DES is an Efficient, reliable, cost-effective and alternative method over organic solvents. This is the first industrially feasible process based on solvent extractions for the isolation of cardanol from technical CNSL.

**Keywords**

Cashew Nut Shell Liquid, Cardanol, Isolation, Deep Eutectic Solvent, Extraction

**ICIRIST-IRP-042**

# A NEW TEMPLATE ASSISTED AUTO COMPUSTION METHOD (TAAC) TO SYNTHESIZE LiCoO2


## ABSTRACT

Lithiated transition metal oxides have been extensively studied as cathode materials for commercial lithium ion recharchable batteries. Among those oxides, $LiCoO_2$ is most widely used as the cathode material for commercial secondary lithium batteries due to its advantages including easy preparation and high theoretical specific capacity. Synthesis of $LiCoO_2$ is generally divided into two methods a solid state method and a solution method. A solid state method consists of grinding and calcination of hydroxide or carbonates such as LiOH, $LiCO_3$ and $CoCO_3$. A solution method required condensation of a solid oxide network starting from soluble species and a thermal treatment leading to oxide $LiCoO_2$ . this method makes possible a better mixing of the elements and therefore a better reactivity of the mixture which then allows lower reaction temperature and shorter reaction time. Two preparation techniques have been reported as solution method for synthesis of $LiCoO_2$ One is a synthesis of $LiCoO_2$ using a precipitation process in aqueous solution of hydroxide, nitrates, and acetate salts.In this study $LiCoO_2$ powder were synthesis using template assisted auto combustion, template, and auto combustion methods and their physical properties were studied as a function of calcination temperature by Thermo Gravimetry and Differential thermal analysis (TG/DTG), Differential Scanning Calorimetry (DSC), Fourier transform spectroscopy (FTIR) X-ray diffraction(XRD), Atomic Force Microscope.

**ICIRIST-IRP-043**

# The Copper(II) complexes with mixed ligands of 1, 10-phenanthroline / 2-2' bipyridyl, L-methionine and ethylamine : Synthesis, characterization and DNA binding

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## ABSTRACT

The ternary copper (II) complexes [Cu(phen)(L-met)EA)] 1 & [Cu(Bpy)(L-met)EA] 2 ( phen = 1,10-phenanthroline Bpy = bipyridyl, L- Methionine and EA= Ethylamine), have been synthesized and characterized by CHN analysis molar conductance, electronic absorption, IR and EPR spectral studies. They have been tested for their in vitro DNA binding activities by the spectroscopic methods. Further, complexes 1 and 2 displayed significant cytotoxicity when examined in-vitro on a panel of cancerous cell line -human liver cancer cell line -HepG-2 cells (IC50= 40.85 and 29.84 μg/ml). Further complexes 1 & 2 were tested for their antimicrobial activities and it was found to have good antimicrobial activities.

## Keywords

Copper (II) Complexes, L-Methionine, Thiourea, DNA Binding & Cytotoxicity

**ICIRIST-IRP-044**

# AN EXPERIMENTAL STUDY ON PURIFICATION OF GREYWATER BY USING MORINGA OLEIFERA

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## ABSTRACT

The main abstract of our project is to purify the kitchen waste water by using natural coagulants. Over a past few years, water treatment plants use a variety of chemicals to remove contaminants that affect the taste, odour and overall safety of the water. So we use the natural coagulants like drumstick seed to reduce the turbidity of the kitchen waste miter. The natural coagulant is a natural based coagulant that can be used in coagulation process of water treatment for reducing the turbidity, odour etc. Once the coagulant is introduced in the water, the individual colloids must aggregate and grow bigger so that the impurities can be settled down at the bottom of the beaker and separated from the water suspension. Iron coagulants are commonly used in most industries. However, when Iron coagulants is used as a coagulant in waste water treatment, it can caused several bad effect on human health such as intestinal constipation, loss of memory, convulsions, abdominal colic's, loss of energy and learning difficulties. Hence nowadays, there has been great attention in the improvement and implementation of natural coagulants in wastewater treatment. These natural coagulants can be formed or extracted from animal, microorganisms and also plant. Natural coagulants used for our study are Moringa Oleifera are locally available from vegetables and seeds.

**Keywords**
treatment, moringa oleifera,natural coagulant,eco friendly

**ICIRIST-IRP-045**

# AN EXPERIMENTAL INVESTIGATION ON GROUND GRANULATED BLAST FURNACE SLAG AND BAGASSE ASH INFUSED CEMENT CONCRETE

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## ABSTRACT

Concrete is a mixture of cement, fine aggregate, coarse aggregate and water. Concrete is the building block in modern construction. With the growth in the infrastructure the importance of concrete has increased manifold. Concrete plays a vital role in the development of infrastructure, buildings, industrial structures, bridges and highways etc. This requirement is drawn the attention of investigators to explore new replacements of ingredients of concrete. Replacement of cement with various mineral admixtures has been proven to augment the strength and durability properties of concrete greatly. This paper presents the properties and strength of M 20 grade concrete mixes (M0, M10, M15, M25) and its behavior with the partial replacement of cement by mineral admixtures like sugar cane bagasse ash, ground granulated blast furnace slag (GGBS) in concrete. This usage of GGBS serves as replacement to already depleting conventional building materials and the recent years and also as being a by-product it serves as an Eco Friendly way of utilizing the product without dumping it on ground.

**Keywords**

Cement, Mineral Admixtures, Durability Properties, sugar cane bagasse ash and GGBS.

ICIRIST-IRP-046

# EXPERIMENTAL INVESTIGATION ON CONCRETE USING IRON SLAG AS A PARTIAL REPLACEMENT OF FINE AGGREGATE

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## ABSTRACT

The environment problems are very common in India due to generation of industrial byproducts. Due to industrialization enormous byproducts are produced and to utilize these byproducts is the main challenge faced in India. Iron slag is one of the industrial byproduct from the iron and steel making industries. Considering the physical and chemical properties of metallurgical slag and a series of possibilities for their use in other industrial branches, so it is used in the field of civil constructions. Iron slag was used to replace 15%, 30%, 45% and 60% of sand by weight. The strength of concrete increases rapidly with increasing the iron slag content and the optimum value of compressive strength is obtained at 45% replacement. After 45% replacement the strength decreases. Similarly in the case of tensile strength, the strength increases with the increase in iron slag content and the optimum value of split tensile strength is obtained at 30%. The study confirm that the use of iron slag overcome the pollution problems in the environment. The results shows that the iron slag added to the concrete had greater strength than the plain concrete.

Keywords

Metallurgical slag, iron slag, split tensile strength

ICIRIST-IRP-047

# EXPERIMENTAL INVESTIGATION OF LIGHTWEIGHT SOLID BLOCK BY USING WATER AND FOAMING AGENT

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## ABSTRACT

A lightweight block typically refers to a type of construction material used in building. It is characterized by its lower density compared to traditional concrete blocks, making it easier to handle and transport. Lightweight blocks are often made from materials like expanded clay, shale, or aerated concrete. They offer advantages such as improved insulation properties and ease of construction. The foam solid block is a type of aerated lightweight concrete. Foamed cement is the most well-known of all low thickness cements in creating nations. The utilization of Lightweight Concrete squares gives an appropriate answer for development industry alongside natural conservation. It is created by at first making slurry of Cement, Fly Ash, Rice Husk Ash, Water and Foaming Agent. Then compressive strength, water absorption test and Dry density test for solid block.

## Keywords

Lightweight concrete, Solid block, Cement, Fly Ash, Rice Husk Ash, Water and Foaming Agent, Compressive strength, Water absorption test and Dry density

ICIRIST-IRP-048

# ENHANCING THE SAFTEY PERFORMANCE OF HIGHWAY USERS

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## ABSTRACT

This project helps improve the safety of road travelers. An investigation is chosen high accident occurring places in highways and investigation into how a road accident occurs. Then some of questions raised about the cause of the accident and these questions are raised to people, contractors and engineers The project is being studied for a distance of 5km from perambalur new bus stand to thanneer panthal. The marks are given to each questions based on people, contractors and engineers answers. According to the questionnaire survey, the answers given by the peoples, contractor and engineers were grafted by excel.an improving highway safety involves implementing measures such as:Traffic Signage and Signals: Ensure clear and visible road signs, signals, and markings to guide drivers effectively.Speed Limits and Enforcement: Set appropriate speed limits and enforce them rigorously to reduce the risk of accidents.Road Design and Maintenance: Design roads with safety in mind, addressing factors like curves, intersections, and proper maintenance to minimize hazards.Education and Awareness: Conduct public awareness campaigns to educate drivers about safe driving practices and the importance of following traffic rules.Advanced Driver Assistance Systems (ADAS): Promote the use of technology like lane departure warnings, automatic emergency braking, and adaptive cruise control to enhance vehicle safety.

## Keywords

Safety of road, signs, signals and Advanced Driver Assistance Systems

ICIRIST-IRP-049

# SMART POLICING TECHNIQUE WITH CRIME TYPE AND RISK SCORE PREDICTION

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## ABSTRACT

The paper presents a novel smart policing technique that integrates crime type and risk score prediction to improve the effectiveness of law enforcement. The proposed technique utilizes machine learning algorithms to analyze crime data and generate predictive models that can forecast the likelihood of different crime types occurring in a particular area. The risk score prediction is based on factors such as past crime history, socio- economic conditions, and demographic information. The technique employs a classification model to categorize crimes into high, medium, and low-risk categories. The risk score helps law enforcement agencies to allocate their resources efficiently and prioritize high-risk areas. The proposed technique was tested using real-world data from the New York Police Department (NYPD), and the results showed promising outcomes. The technique could accurately predict the occurrence of various crime types with an accuracy of over 90%. Additionally, the risk score prediction helped to reduce the response time of law enforcement agencies to high-risk areas, leading to a quicker resolution of criminal activities. In conclusion, the proposed smart policing technique provides a promising approach for enhancing law enforcement effectiveness by predicting crime types and risk scores. The technique's accuracy in forecasting and prioritizing high-risk areas could help prevent and deter criminal activities, leading to a safer community.

ICIRIST-IRP-050

# ONLINE TRAIN TICKET BOOKING MANAGEMENT SYSTEM


## ABSTRACT

In this emerging world of computers all most all manual system automated and computerized but maximum of them are so complex and a common user is unable to operate that software system. This project explores how computer technology can be used to solve the problem of user. A high speed communication network needs to be developed for interconnecting the offices of railways. The system display list of available trains and allows customer to choose a particular train. The main purpose of this application is to reduce the manual errors involved in the railway reservation process and make it convenient for the customers to book the trains as when they require such that they can utilize this software to make reservations, modify train details, maintain employee details etc. Reservations can be made through the Indian railways site or at the sample reservation centers all over the country. Also now there are authorized agencies which provide reservation facility on behalf of India railways and without waiting in long line one can easily book a ticket. The booking is done through an E Ticket issue which has a PNR number of which one has to take a print and just have to show at the station. This being a big step in terms of improvement in the railway system it is widely accepted across the country.

**ICIRIST-IRP-051**

# DRIVER DISTRACTION DETECTION BASED ON OBJECT DETECTION USING DEEP LEARNING ALGORITHM

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## ABSTRACT

Driver distraction is a significant factor contributing to road accidents worldwide. According to statistics, distracted drivers are three times more likely to be involved in a crash than non-distracted drivers. Therefore, detecting driver distraction is crucial for improving road safety. Many previous studies have proposed various methods for driver distraction detection, including image-based, sensor-based, and machine learning-based approaches. However, these methods have limitations in terms of accuracy, complexity, and real-time performance. This project proposes a novel approach to driver distraction detection using the You Only Look Once (YOLO) object detection algorithm with a convolutional neural network (CNN). The proposed model consists of two main stages: object detection using YOLO and classification of the detected objects. The YOLO algorithm is used to detect and locate various objects in the driver's environment, including the driver's face and hands, and other objects that may cause distraction. Then, the detected objects are classified using a CNN to determine whether the driver is distracted or not. The proposed model is evaluated using a public dataset and achieves high accuracy in detecting driver distraction. The proposed method has the potential to be integrated into advanced driver assistance systems to improve road safety with real time environments.

**ICIRIST-IRP-052**

# MULTIPLE CANCER PREDICTION BASED ON GENE EXPRESSION USING OPTIMIZATION AND CLASSIFICATION ALGORITHM


## ABSTRACT

DNA microarray technology has modernized the approach of biology research in such a way that scientists can now measure the expression levels of thousands of genes simultaneously in a single experiment. Gene expression profiles, which represent the state of a cell at a molecular level, have great potential as a medical diagnosis tool. Diseases classification with gene expression data is known to include the keys for addressing the fundamental harms relating to diagnosis and discovery. The recent introduction of the DNA microarray technique has complete simultaneous monitoring large number of expressions possible. With this large quantity of gene expression data, experts have started to discover the possibilities of disease classification using gene expression data. Quite a large number of methods have been planned in recent years with hopeful results. But there are still a set of issues which need to be address and understood. In order to gain insight into the disease classification difficulty, it is necessary to get a closer look at the problem, the proposed solutions and the associated issues all together. In this project, we present a comprehensive searching method, clustering method and classification method such as Pattern similarity search, Particle Swarm optimization, Convolutional neural network classification and estimate them based on their evaluation time, classification accuracy and ability to reveal biologically meaningful gene information. Based on our multiclass classification method to diagnosis the diseases such as Cancer (Lung, Blood, Breast, and Skin) diseases and other diseases and also find severity levels of diseases and also prescribe the medicine for affected diseases. Our experimental results show that classifier performance through graphs with improved accuracy.

**ICIRIST-IRP-053**

# BRAIN TUMER CLASSIFICATION USING PRETAINED DEEP CONVOLUTIONAL NEURAL NETWORKS

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## ABSTRACT

Brain diseases classification is the most challenging process due to their sensitivity, the difficulty of executing operations, and the high expenses. Brain tumors are a significant and potentially life-threatening medical condition that demands accurate and timely diagnosis for effective treatment planning. Magnetic Resonance Imaging (MRI) has emerged as a vital tool in the field of medical imaging, offering detailed and non-invasive visualization of the brain's internal structures. Brain tumor detection using MRI images has become a cornerstone in the diagnosis and management of these conditions. The proposed approach begins by pre-processing the dataset, which consists of MRI scans and clinical data from individuals with different brain disease conditions. Dataset consists a diverse range of brain images, including both tumor and non-tumor cases. The dataset is divided into training and testing sets, ensuring a balanced distribution of samples for each class. On MRI scans, many procedures are needed to identify tumors, including image pre-processing, feature extraction, and classification. Convolutional Neural Networks with VGG 16 model algorithm will be using in this project. The VGG-16 model, known for its deep architecture and robust feature extraction capabilities, a highly efficient architecture designed for image classification tasks. The findings will be revealing several notable advantages of transfer learning models over VGG-16 approach. The transfer learning models automatically learning hierarchical features from raw image data, eliminating the need for manual feature engineering. This feature extraction capability enables CNNs to capture subtle and complex patterns within brain images, enhancing their diagnostic accuracy. The results of proposed work will demonstrate the effectiveness of the proposed method to detect the brain tumors, which will achieve high accuracy, precision, recall and F1-measure. Based on model accuracy, user can input the test brain MRI image to predict the tumor with types and also provide the diagnosis details about predicted disease. Experimental results shows that the proposed model provide improved efficiency in disease prediction.

**ICIRIST-IRP-054**

# AN EFFICIENT BLOCKCHAIN ENABLED SCORE VOTING WITH FACE RECOGNITION

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## ABSTRACT

The security considerations of the votes are based on block chain technology using cryptographic hashes to secure end-to-end verification. To this end, a successful vote cast is considered as a transaction within the block chain of the voting application. Therefore, a vote cast is added as a new block (after successful mining) in the block chain as well as being recorded in data tables at the backend of the database. The system ensures only one-person, one-vote (democracy) property of voting systems. This is achieved by using the voter's unique face image, which is matched at the beginning of every voting attempt to prevent double voting. The Face Recognition is the study of physical or behavioral characteristics of human being used for the identification of person. So implement real time authentication system using face biometrics for authorized the person for online voting system. This work claims to score voting method and data management challenges in block chain and provides an improved manifestation of the electronic voting process. Score-based voting methods, also known as range voting or rated voting, are electoral systems where voters are allowed to express their preferences for candidates or options by assigning numerical scores to them. Unlike traditional voting methods where voters choose a single candidate, score-based systems enable voters to provide a more nuanced and detailed assessment of their preferences. It is important here to note that cryptographic hash for a voter is the unique hash of voter by which voter is known in the block chain. This property facilitates achieving verifiability of the overall voting process. Furthermore, this id is hidden and no one can view it even a system operator cannot view this hash therefore achieving privacy of individual voters.

**ICIRIST-IRP-055**

# TREE LEAVES BASED DISEASE PREDICTION AND FERTILIZER RECOMMENDATION USING DEEP LEARNING ALGORITHM

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## ABSTRACT

The health of trees plays a crucial role in maintaining ecological balance and sustaining diverse ecosystems. Early detection of diseases affecting tree leaves can aid in timely intervention and mitigation efforts. This research proposes a novel approach to tree disease prediction by leveraging deep learning, specifically the VGG16 convolutional neural network architecture. The study focuses on analyzing high-resolution images of tree leaves to classify them as either healthy or afflicted by a particular disease. The methodology involves the collection of a comprehensive dataset comprising diverse images of tree leaves, encompassing various species and disease types. Data preprocessing techniques, including image resizing, normalization, and augmentation, are employed to enhance the robustness and generalization of the model. The pre-trained VGG16 model is utilized for feature extraction, and the top layers are customized to suit the tree disease prediction task. The proposed model undergoes rigorous training and validation processes to optimize its performance. Evaluation metrics such as accuracy, precision, recall, and F1 score are employed to assess the model's effectiveness in disease classification. The research aims to provide a reliable and efficient tool for arborists, foresters, and environmentalists to identify and address tree diseases promptly. The outcomes of this study contribute to the advancement of precision agriculture and environmental monitoring, offering a scalable and automated solution for early tree disease detection. Furthermore, the research explores potential applications in real-world scenarios, fostering sustainable practices for the preservation of global ecosystems.

**ICIRIST-IRP-056**

# AUTOMATIC CRIMINAL DETECTION BY SURVEILLANCE SYSTEM USING RECOGNITION APPROACH

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## ABSTRACT

Face recognition is an interesting and challenging problem and impacts important applications in authentication and personal identification among others. Extraction of these important elements from a picture, their useable representation, and classifications are the core concepts of automatic face recognition. Face recognition based on the geometric features of a face is probably the most instinctive approach for Human identification. The entire process may be broken down into three main parts, with the first step being the search for a reliable database of faces that includes numerous photographs for each person. The next phase is to find faces in the database photos so that the face recognizer can be trained on them. The last step is to test the face recognizer to see if it can still find the faces that it was trained on. Here implement an application for criminal detection, it helps forensic department for the accurate identification of criminal using his face image. The training face images are initially collected and stored on server. This system provides essential security to apartments and other control applications. During face capturing the face image will be match with registered images. An efficient classifier uses to classify the face images accurately. Criminal images are collected and stored by forensic department. During capturing process, face image will be classified with the criminal image database. If a match is made, we will be able to identify the offender and quickly make an arrest.

**ICIRIST-IRP-057**

# Fake Profile Identification in Social Network using Machine Learning and NLP

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**ABSTRACT**

At present social network sites are part of the life for most of the people. Every day several people are creating their profiles on the social network platforms and they are interacting with others independent of the user's location and time. The social network sites not only providing advantages to the users and also provide security issues to the users as well their information. To analyze, who are encouraging threats in social network we need to classify the social networks profiles of the users. From the classification, we can get the genuine profiles and fake profiles on the social networks. Traditionally, we have different classification method s for detecting the fake profiles on the social networks. But, we need to improve the accuracy rate of the fake profile detection in the social networks. In this project are proposing Machine learning and Natural language Processing (NLP) techniques to improve the accuracy rate of the fake profiles detection. The fake profile identification using techniques Support Vector Machine .

**ICIRIST-IRP-058**

# QR WITH BLOCKCHAIN BASED COUNTERFIET PRODUCT IDENTIFICATION

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## ABSTRACT

Product tracking using block chain technology involves creating a tamper-proof and immutable record of a product's journey from its creation to its delivery. This can be achieved by creating a digital ledger that records every step of the product's journey, from its origins to the point of sale. Using block chain technology for product tracking can provide a number of benefits, including increased transparency and accountability, reduced fraud, and improved efficiency. The use of block chain technology can help prevent the production and distribution of counterfeit products by creating a secure and transparent supply chain. One of the key features of block chain technology is its ability to create a decentralized ledger of all transactions that occur within a given network. Each transaction is verified by a network of nodes, making it nearly impossible to tamper with or manipulate the data stored on the block chain. By using block chain technology, manufacturers and distributors can track every step in the supply chain, from the sourcing of raw materials to the delivery of finished products to consumers. This can help ensure that every product is authentic and has not been altered or replaced with a counterfeit. In this application provides a block chain-based solution for combating counterfeit products is the use of unique digital identities, or "cryptographic hashes," for each product. These hashes are recorded on the block chain, allowing anyone to verify the authenticity of a product by scanning its barcode or QR code. The digital identity can also include information about the product's origin, manufacturing history, and other relevant details. Overall, the use of block chain technology can provide a powerful tool for preventing the production and distribution of counterfeit products. By creating a secure and transparent supply chain, manufacturers and distributors can build trust with their customers and ensure the safety and authenticity of their products.

**ICIRIST-IRP-059**

# AIRCRAFT ANALYSIS FROM REMOTE SENSING IMAGES USING CNN ALGORITHM

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**DSEC**

**ABSTRACT:**

Imaging processing heavily relies on aircraft recognition. Aircraft form is extracted using a recognition processor. An item or element in a digital picture or video can be recognized and identified using image recognition technology. Face recognition, license plate matching, optical character image recognition, and scene change identification are examples of common image recognition techniques. In order to identify objects in an image stream, object identification would likely start with image processing techniques like noise reduction, followed by (low-level) feature extraction to identify lines, regions, and potentially areas with specified surfaces. Even within a same kind, the texture and intensity are frequently variable depending on the situation. Additionally, identification is usually hampered by diverse disruptions including clutter, disparate contrasts, and homogeneity fear. Therefore, the approach heavily depends on robustness and disturbance resistance. This technology makes use of neural networks to recognize aero planes. A satellite picture is used as the input, and a Gabor filter is used to process it. It is used to extract feature data, such as form, size, and texture. The magnitude response of the filter outputs are then used to create the feature vector, which eases the numerical challenges. At last, an airplane is identified. Dimensionality reduction, segmentation, and template-based aircraft identification are all part of this recognition method. Particularly, it is suggested to minimize the dimensionality of the satellite picture using a main component analysis. The targeted item is then distinguished from the background using histogram probability thresholding. Here, local object form descriptors are extracted using connected component analysis in order to identify the intended target. The corresponding model is the template. Finally, simulation showed that object tracking in remote sensing photos is possible with the aid of the employed methodologies

**ICIRIST-IRP-060**

# Blockchain Solutions Using AI

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**ABSTRACT**:

The aim of a project to develop an innovative blockchain solution empowered by artificial intelligence (AI) to revolutionize traceability and transparency within the supply chain. By integrating AI algorithms, the system enhances the identification and tracking of products at each stage, fostering a more intelligent and efficient supply chain ecosystem. The blockchain ensures secure and tamper-resistant data sharing among stakeholders, employing advanced cryptographic techniques to safeguard sensitive information. Moreover, the implementation focuses on scalability, addressing the growing demands of a dynamic supply chain environment. This intersection of blockchain and AI not only fortifies the integrity of the supply chain data but also introduces intelligent insights, contributing to a more resilient.

**Keyword**

Blockchain, Artificial Intelligence, Supply Chain, Traceability, Transparency, Data Sharing Security, Scalability, Cryptography, Smart Contracts, Decentralization, Tamper-Resistance Stakeholders, Intelligent Insights, Resilient Infrastructure

**ICIRIST-IRP-061**

# DEEP LEARNING APPROACH FOR LOCATING FIREARM USING SURVEILLANCE FOOTAGE

**R.ARCHANA, DSEC**


## ABSTRACT

Numerous figures show that the rate of violence using firearms and dangerous weapons is rising yearly, making it challenging for law enforcement organizations to address this issue promptly. Knives and guns are frequently utilized in crimes, especially in places where there are no restrictions on the possession of firearms. Security of the populace depends on the early identification of violent crime. Using security cameras to spot the presence of hazardous weapons like knives and firearms is one technique to prevent these occurrences. Current surveillance and control systems still require manual monitoring and intervention. In this system, the method of automated weapon identification in video is excellent for monitoring and controlling. Modern deep learning models, such as the YOLO (You Only Look Once) algorithm, are used to identify firearms in real-time cameras. These models are well known for their ability to recognize objects quickly and accurately by using convolutional neural networks (CNN). It trains each component separately and focuses on a certain portion of the image. A YOLO model, in comparison, only passes an image through the neural network once. Handguns, knives, and heavy weapons are the three categories of weapons for which the dataset has been trained. Authorities are alerted when the weapon is found so they may take the necessary steps to stop violent crimes from happening.

ICIRIST-IRP-062

# OBJECT DETECTION IN RAILWAY LINE USING ARTIFICIAL INTELLIGENCE TECHINIQUES

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## ABSTRACT

Object detection in railway lines is a critical domain in the railway industry, aiming to enhance safety, operational efficiency, and the overall reliability of rail transportation. Various technologies and methods can be employed for object detection in railway lines, including but not limited to computer vision, LiDAR, radar, thermal imaging, and sensor networks. Machine learning and deep learning algorithms can be used for image and data analysis to classify and track objects such as trains, maintenance equipment, trespassers, or obstructions. Additionally, sensors and detectors can be strategically placed along the railway lines to capture critical data. This project delves into the advancements and challenges associated with object detection systems along railway lines. And aims to provide a holistic view of object detection in railway environments. It covers a wide range of topics, including the types of objects detected, the methods and technologies employed, real-world applications, and the future prospects of the field. Central to this system is the acquisition of data, primarily through high-resolution images and videos. These data sources originate from a variety of locations, including fixed cameras positioned along the railway tracks and cameras mounted on locomotives. This multi-source data collection is a crucial foundation for real-time monitoring and analysis, enabling the system to respond promptly to detected objects or potential obstacles. By combining data from multiple sources, the system provides a more comprehensive and accurate understanding of the railway environment, ensuring both safety and efficiency are prioritized

**ICIRIST-IRP-063**

# IMAGE STEGANOGRAPHY WITH FACE RECOGNITION

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## ABSTRACT

Image Steganography with face recognition is used to hide confidential data in the form of plain text,image,video or audio.Steganography is a process of wrapping the data into another data or object.In our project we are using python mainly and some other GUI,API. Face recognition will include detection of our face,nose,eyes and mouth.Using Haar Cascade in open CV with Python.The message is opened when the authorised user face can be detected and then the message will be decoded.When a user stores a data in the form of image they can open only when their face is analysed and register the face and then open their file or data.

**Keyword**

Steganography, Python, Decoding, Data, Image or any other format

**ICIRIST-IRP-064**

# An Overview of Blockchain Technology: Consensus, and Future Trends

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## ABSTRACT

Blockchain, the backbone of Bitcoin, has recently captured widespread attention. This technology functions as an immutable ledger, enabling decentralized transactions. Its applications have surged across various domains like financial services, reputation systems, and the Internet of Things (IoT). Despite its promise, blockchain faces hurdles, notably scalability and security issues that demand resolution. This paper offers a holistic view of blockchain technology. It delves into its architecture, compares various consensus algorithms used in different blockchains, highlights technical challenges and recent progress, and presents potential future directions for blockchain.

## Keyword

Blockchain, decentralization, consensus, scalability

**ICIRIST-IRP-065**

# An Overview of Blockchain Technology: Architecture, Consensus, and Future Trends

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## ABSTRACT

Blockchain, the backbone of Bitcoin, has recently captured widespread attention. This technology functions as an immutable ledger, enabling decentralized transactions. Its applications have surged across various domains like financial services, reputation systems, and the Internet of Things (IoT). Despite its promise, blockchain faces hurdles, notably scalability and security issues that demand resolution. This paper offers a holistic view of blockchain technology. It delves into its architecture, compares various consensus algorithms used in different blockchains, highlights technical challenges and recent progress, and presents potential future directions for blockchain.

**ICIRIST-IRP-066**

# EFFECTIVE MODEL DEVELOPMENT OF VILLAGE MONITOR SYSTEM TIMER

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**ABSTRACT**

The development of a country depends on the village's development. As part of the smart village concept, we need a system that helps in development of villages in the areas like primary education, people's healthcare, roads and transportation, drinking water facilities, government policies awareness and availability of basic facilities/infrastructure. This system helps the members to collaborate, plan, assess and implement different activities and learn with others experience/feedbacks and suggestions. Smart Villages' - the community, individuals and collectively, will be empowered to take smart decisions using smart technologies, communication and innovations. The Partner(s) will be encouraged to bring in innovative ideas, modern technologies and efficient usage of resources. Smart Village Monitoring System can facilitate life and satisfy the needs of people, companies and organizations. The administrative module helps to customize search to meet the needs of users. This module gives information that serves as the backbone for the rest of the system. Users can register and give their complaints the necessary action will be taken through concern officers and status of the complaints also updated.

**Keyword**:
Smart village, Innovative idea, monitoring system

**ICIRIST-IRP-067**

# Enhancing Vehicular Ad Hoc Networks Security: A Machine Learning Approach for Identifying and Mitigating Distributed Denial of Service Attacks

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**ABSTRACT**

Vehicular Ad Hoc Networks (VANETs) play a crucial role in modern transportation systems, enabling vehicles to communicate seamlessly that makes them susceptible to security threats, particularly Distributed Denial of Service (DDoS) attacks. The proposed algorithm combines the strengths of traditional machine learning techniques with enhancements tailored to the unique characteristics of VANETs. We employ Random Forest with Adaptive Learning Rate (RF-ALR) to dynamically adapt to the evolving nature of DDoS attacks in real-time, providing an effective defense mechanism for the vehicular communication infrastructure. To evaluate the performance of our proposed algorithm, we conducted extensive simulations using the NS-3 network simulator. Our experimentation considered various parameters, including network traffic, mobility patterns, and attack intensities. We measured key metrics such as detection accuracy, false positive rate, and response time to assess the algorithm's effectiveness in identifying and mitigating DDoS attacks while minimizing false positives. This research contributes to the ongoing efforts to enhance the security of vehicular communication systems, ensuring the reliability and safety of future smart transportation networks.

**Keyword**

Vehicular Ad Hoc Networks, Distributed Denial of Service Attacks, Machine Learning Algorithm, Security Enhancement, Random Forest with Adaptive Learning Rate

**ICIRIST-IRP-068**

# Ethical hacking
# The need for cyber security

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**ABSTRACT:**

White hat hackers play a vital role in preventing cyber-attacks by proactively identifying weaknesses before malicious hackers can exploit them. They conduct penetration tests, vulnerability assessments, and other ethical hacking activities to strengthen the overall security posture of organizations. On the other hand, black hat hackers engage in unauthorized activities with malicious intent, such as stealing sensitive information, disrupting services, or causing damage to computer systems. This type of hacking is illegal and poses significant risks to individuals, businesses, and society as a whole. The field of cyber security relies on ethical hacking to stay ahead of potential threats and protect against evolving cyber risks. By understanding and addressing vulnerabilities before they can be exploited, organizations can better safeguard their digital assets. It's essential to promote ethical hacking practices and educate people about the positive impact they can have on cyber security.

**Keyword**

Hacking, Cyber Security, Digital World, Cyber-Risk, Black hats, White hats, Sensitive information's

**ICIRIST-IRP-069**

# FaaS BASED HOSPITAL AUTOMATION SYSTEM

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**ABSTRACT:**

In accordance with regulations, it is the responsibility of a pharmacist to verify the prescription's completeness, authenticity, and legality before dispensing any medication. However, the absence of an effective tracking system has resulted in the diversion of prescription drugs and their components for illicit recreational use. To address this issue, a proposed solution involves the development of an Android application that utilizes QR codes to monitor the journey of medicines from the manufacturer to the retailer. These QR codes contain product information that will be securely stored in a database maintained by the manufacturer. This innovative system enables the tracking of the supply chain for prescription drugs, ensuring their safe delivery to the end user.

**Keyword**

Pharmacist, Doctors, Android application, QR code, Digital signature, FaaS (Function as a Service).

**ICIRIST-IRP-070**

# FAKE PRODUCT IDENTIFICATION USING BLOCKCHAIN TECHNOLOGY

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**ABSTRACT**

The focuses on combating counterfeit products in manufacturing industries through the implementation of a Fake Product Identification System using block chain technology. Counterfeit goods pose a significant threat to company reputation, sales, and profits. Block chain, a secure, distributed ledger, is employed to identify authentic products and detect fake ones. The decentralized nature of block chain ensures the integrity of transactional information stored in interconnected blocks. This system eliminates the reliance on third-party confirmations for product safety, enhancing consumer trust. Leveraging emerging mobile and wireless technology, Quick Response (QR) codes are utilized to link products to the block chain. Counterfeit detection is achieved by scanning the QR code, providing a robust solution against the practice of counterfeiting.

**Keyword**

Counterfeit detection, Product authenticity, QR Codes, Secure Transactions, Counterfeit Prevention.

**ICIRIST-IRP-071**

# BERSIH

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## ABSTRACT

The project, "Clean Society with Digitalization," aims to leverage digital technology to promote sustainability and cleanliness in tier-one cities. BERSIH, which means clean, is our project's motive. It is the responsibility of every individual to maintain cleanliness in our tier 1 city. However, we still need to take it to the next stage by extending it to tier 2 and 3 cities. People follow many methods to remove garbage, and our government has made many arrangements for its disposal. However, a lot of waste is still unnecessarily produced. This project provides a solution to prevent that. As the country goes digital, we should not forget about the way we litter. This initiative will involve the use of smart cards to track daily paper usage and disposal, providing valuable data that can be used to encourage more environmentally friendly behaviours. The smart card's main role is similar metro card, it helps users identify a manage garbage status to easily develop instructions. The project aims to leverage digital technology to promote sustainability and cleanliness in tier-one cities. The initiative will involve the use of smart cards to track daily paper usage and disposal. "Clean Society with Digitalization" is a project of BERSIH.

**Keyword**

project, cleanliness, clean, disposal, garbage, smart, cards, however, cities, tier.

**ICIRIST-IRP-072**

# QR CODE BASED ATTENDANCE MANAGEMENT SYSTEM TIMER

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**ABSTRACT**

Attendance management system is an innovative tool to maintain and manage the attendance of students. These QR code has a wide range of application in this evolution technology world. QR code used to store massive information in a smaller space. So we decided to use QR code in our system and proposed smart attendance is achieved using data hiding algorithms with the embedded QR code. In our project by using smartphone students can which will displayed by the teacher. When students scan this QR code automatically attendance will be marked according to the user id. It also discusses how the system verifies student identify to eliminate false registration. Report of the student's attendance on weekly and monthly basis is generated as desired. The main objective of the automated attendance system is to computerize the traditional way of recording attendance and provide an efficient and automated method to track attendance in institutions.

**Keyword**

QR Code scan, Attendance, software requirements PHP, MYSQL; coding language: HTML, CSS and PHP.

**ICIRIST-IRP-073**

# ROBUST SECURITY MEASURES IN CLOUD COMPUTING WITHIN THE HIGHER EDUCATION SECTOR

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**ABSTRACT**

The abstract explores the imperative need for robust security measures in cloud computing within the higher education sector. As institutions increasingly leverage cloud services for data storage, processing, and collaborative applications, the inherent vulnerabilities pose significant challenges to safeguarding sensitive academic and administrative information. This paper delves into the unique security concerns specific to higher education, emphasizing the critical role of confidentiality, integrity, and availability in maintaining the trust of stakeholders. It examines current best practices, emerging trends, and potential solutions to fortify cloud-based infrastructures, ensuring a resilient and compliant environment that not only protects against cyber threats but also promotes the uninterrupted advancement of educational missions in the digital era.

**Keyword**

Cloud computing security, higher education, data protection, confidentiality, integrity, availability, cyber threats, best practices, compliance, sensitive information, collaborative applications, resilient infrastructure, emerging trends, academic missions, digital era.

**ICIRIST-IRP-074**

# FRAUD MALWARE DETECTION IN GOOGLE PLAY STORE MOBILE APP

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## ABSTRACT

Fraudulent behaviour on Google Play, the most popular Android app market, fueled search ranking abuse and malware proliferation exploiting cyber security. Current methods for detecting fraud and malware on Google Play focus on analyzing app executables and permissions, but they face limitations in dealing with sophisticated and evolving threats. In this paper, we introduce a new system called Fair Play, which detects traces left by fraudsters and helps detect both malware and apps involved in search rank fraud. Fair Play uniquely combines detected review relationships with linguistic and behavioural signals collected from Google Play usage data (87 K apps, 2.9 M reviews and 2.4M reviewers, 2.4M reviewers) to correlate review activity and identify suspicious apps. Fair Play achieves over 95 percent accuracy in classifying gold standard datasets of malware, fraud and legitimate applications. We show that 75 percent of identified malware applications engage in search ranking fraud. Fair Play has identified hundreds of fraudulent apps that currently evade Google Bouncer's detection technology. Fair Play found more than 1,000 reviews reported for 193 apps, revealing a new type of "coercive" review campaign: users are harassed into writing positive reviews and installing and reviewing other apps.

## Keyword

Fair play, Malware, Detection, Ranking and Reviews, Coercive

**ICIRIST-IRP-075**

# THE IMPACT OF 5G ON CLOUD COMPUTING ARCHITECTURE

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## ABSTRACT

This paper investigates the transformative influence of 5G technology on the landscape of cloud computing architectures. With the rollout of high-speed, low-latency 5G networks, the dynamics of cloud services and infrastructures are undergoing significant changes. The paper explores how 5G facilitates enhanced connectivity, unlocking new possibilities for edge computing, real-time applications, and IoT deployments in the cloud. It delves into the architectural adaptations required to harness the full potential of 5G, addressing challenges and opportunities associated with integrating this advanced networking paradigm into existing cloud environments. Through a comprehensive analysis, the paper aims to illuminate the evolving synergy between 5G and cloud computing, shaping the future of digital connectivity and service delivery

## Keyword

5G Technology , Dynamics of cloud services, Shaping the future of digital connectivity

**ICIRIST-IRP-076**

# PRIVACY-PRESERVING PROTOCOL FOR VANETs TIMER

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## ABSTRACT

A privacy-preserving protocol for Vehicular Ad Hoc Networks (VANETs) is like a secret code that helps cars communicate without revealing too much personal information. It's designed to protect the privacy of drivers and their vehicles while they share important messages on the road, ensuring that sensitive details remain confidential. This protocol helps create a secure and private environment for communication among vehicles, promoting safer and more discreet interactions on the streets.In the bustling world of interconnected cars on our roads, ensuring privacy is crucial. Imagine a Privacy-Preserving Protocol for Vehicular Ad Hoc Networks (VANETs) as a guardian of personal information in the digital realm of moving vehicles.

**Keyword**

Privacy-Preserving Protocol, Secret Code, Sensitive details, Confidential…etc

**ICIRIST-IRP-077**

# Metamaterial-inspired Antenna for LTE, BLUETOOTH and WiMAX Systems with Dual Band Capability

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## ABSTRACT

This study introduces a compact antenna, influenced by metamaterials, that functions across LTE, Bluetooth, and WiMAX frequency bands. The design employs an external square metallic strip for the lower band, causing the patch to emit a magnetic-current loop. An additional loop for the upper band is created by placing a metamaterial structure near the patch's feed line. The 42x32 mm2 antenna is suitable for wireless devices. Its design and numerical analysis were conducted using the HFSS high-frequency structure simulator. A detailed mathematical derivation of the antenna's lumped circuit model is provided. The antenna operates in dual-band from 0.60 ~ 0.64GHz, 2.67 ~ 3.40GHz, and 3.61 ~ 3.67GHz, making it suitable for LTE and WiMAX applications. It also exhibits gains of 0.15 ~ 3.81 dBi and 3.47 ~ 3.75 dBi for the frequency ranges of 2.67 ~ 3.40GHz and 3.61 ~ 3.67GHz respectively.

## Keyword

Metamaterials, HFSS high-frequency structure simulator , Dual-band

**ICIRIST-IRP-078**

# Fire Fighting Robot with Call Alerting System

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**ABSTRACT:**

Fire accidents have been occurring frequently these days, with or without the intervention of humans. Different losses would occur in the form of property, land, humans, and animals too. Before the fire gets widespread, we have to inhibit it in the initial stages. With the use of current technology, we have developed a robot. In our work, we will give information about the design and construction of it. This fire fighting robot uses GSM technology. When the robot detects a fire, it starts extinguishing the fire and it gives a message to the user by the use of GSM. This module also gives location details like longitude and latitude where the fire has occurred using GPS and sends messages to the fire department through the GSM module thereby making it possible for the fire department to take necessary actions.

**ICIRIST-IRP-079**

# Design a Circularly Polarized Heart Shaped Inverted L slot Micro Strip Patch Antenna for Wi-Fi Communication

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## ABSTRACT

A hybrid patch antenna featuring a reduced slot-loaded ground plane and a broadband "HEART" form is suggested in this article. A standard circular patch can be effectively upgraded to a "HEART" shape by positioning two circular radiating pieces at key locations on the patch. An inverted L-shaped slot should be present on all four sides of the "HEART"-shaped substrate. Two precisely positioned rectangular holes on the decreased ground plane allow for proper impedance matching over a variety of frequencies. These methods work together to introduce high gain, low profile, and broadband antenna design. The electrical and physical dimensions of the proposed antenna are 0.266λ × 0.241λ × 0.0108λ and 29 mm × 32 mm × 1.6 mm, respectively. The wavelength of the minimum operational frequency is indicated by the symbol λ. With an impedance bandwidth of 5 GHz from (13 GHz to 17.4 GHz), the suggested antenna resonantly functions at 13 GHz, 21.3 GHz, 20 GHz, 24.8 GHz, 18.3 GHz, 17.1 GHz, 16.5 GHz, and 17.4 GHz frequencies. 100% fractional bandwidth, a peak gain of 2.5dBi, and adequate stable E and H field patterns are attained at 21.3 GHz and 24.8 GHz. On the other hand, the design and simulation of the displayed antenna are done using HFSS software. The recommended antenna is designed using the low-cost FR-4 substrate (1.6 mm in height, 0.02 loss tangent, 4.4 dielectric constant). After that, it is investigated with a standard microwave measurement device. A wide range of frequency bands could find application for the proposed antenna, including WiMAX (3.4–3.6 GHz and 5.5 GHz), from 3.3 GHz to 4.2 GHz n77 frequency band, from 3.3 GHz to 3.8 GHz n78 frequency band, from 4.4 GHz to 5 GHz n79 frequency band, and from 5.08 GHz to 5.73 GHz Wireless local area network frequency band. It also covers the 5G-V2X band (3.3-5GHz) and LTE 46 band (5.15-5.925GHz), object placement, high-bandwidth communications, and short-range remote sensing. Index Terms: micro strip patch antenna, equivalent circuit, hybrid, broadband.

ICIRIST-IRP-080

# Development of an Integrated Gas Detection System With Embedded Sensor Fusion and Real-Time Data Analysis

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## ABSTRACT

Safety is crucial in today's world, and this work aims to modify existing safety models in industries and homes and offices. The main objective is to design a microcontroller-based toxic gas detecting and alerting system. Hazardous gases like LPG and propane are sensed and displayed every second on an LCD display. If these gases exceed the normal level, an alarm is generated and an alert message (SMS) is sent to the authorized person through GSM. Automated detection and alerting systems offer quick response time and accurate detection of emergencies, leading to faster diffusion of critical situations. With the increasing development of technology and human activities, pollution has become more severe, particularly in air pollution. To address this, environmental pollution monitoring and control systems are needed to detect and quantify toxic chemicals rapidly. Toxic gases, which cause serious health impacts and are used in large quantities in industries, need to be monitored to determine the normal levels and take proper precautions. Current systems are not portable, costly, and difficult to implement. An embedded system is designed, with SMS sent to authorized users as an alert message, allowing for faster diffusion of emergency situations. The system is affordable and can be easily implemented in chemical industries and residential areas surrounded by chemical plants to avoid human life-threatening situations. It also supports real-time monitoring of air gas concentrations, providing automatic information to prevent human life-threatening situations.

**ICIRIST-IRP-081**

# Fisherman Tracking and Communication Using Wireless Underwater Communication

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## ABSTRACT

The most difficult medium for data communication is the underwater medium. It is due to its characteristics. The various existing mode of the communication in water medium are acoustic waves and optical signal. To overcome these, in this project, a EM technique is used for data transmission in water medium. It uses Magnetic Transmitter sources for transmission of data. This will ensure the maximum transmission rate and it is more efficient and cheaper than the other existing methods. In this project, automation via GPS tracking capabilities are also incorporated. Our proposed system has the aim to give a well understandable user friendly technological mobile computing gadget. To support and give enough awareness of IMBL and protect them not to cross the maritime boundary at any cost. And give full secureness and reliable safety for Indian Fisherman lives. To perform this task some modern concepts of mobile computing method have to be taken into hands. WWSNs, which have components, i.e. the sensors, that are buried underwater and that communicate through Water. The majority of the applications for WWSNs – intelligent communication, environmental monitoring, of the Water. In this proposed system emergency messages are received and send it to the centralized server or fishermen boat through water for emergency conditions.

## Keywords

GPS, GSM, Boat, Fishing boat, Distress alert, Distress message, Emergency, Natural disaster , Level sensor

**ICIRIST-IRP-082**

# Health Self-Assessment System Employing Artificial Neural Networks

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## ABSTRACT

Lately, intelligent applications have become integrated into our daily lives. Within the realm of healthcare, several self-diagnostic medical systems are present. However, only a select few of these systems are accessible to the general public. Specifically, these systems are affiliated with specific hospitals, limiting their use to patients of those institutions. Furthermore, some of these systems are not offered free of charge. This article introduces a self-diagnostic tool for detecting cervical cancer. The system processes symptoms related to the disease and employs artificial neural networks to predict its presence. Additionally, it connects patients with healthcare professionals in their vicinity. Furthermore, it offers patients access to additional information about the disease by guiding them to relevant medical websites. As part of future development, there are plans to expand the system's coverage to include more medical conditions.

## Keywords

medical self-diagnosis, artificial neural network, prediction.

**ICIRIST-IRP-083**

# "Design of 2X2 rectangular microstrip patch antenna for wimax Hotspot coverage"

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## ABSTRACT

Recently, the sector of wireless communication is that the most generally researched space and therefore the study of communication system is incomplete while not knowing the operation and therefore the use of various varieties of antenna. The study of micro strip patch antennas has made nice progress in recent years. Compared with standard antennas, micro strip patch antennas have a lot of blessings and better prospects. they're lighter in weight, low volume, low cost, low profile, smaller in dimension and simple fabrication and conformity. Moreover, the micro strip patch antennas will offer frequency legerity, broad band-width, feed line flexibility in this paper, a compact design and construction of microstrip 2X2 patch array Ultra Wide Band (UWB) antenna is proposed. The proposed antenna has the capability of operating between 4.1 GHz to 10 GHz. The antenna parameter exists in both frequency domain and time domain analysis have been investigated to show its capability as an effective radiating element and Gaussian Pulse as a result, the simulation results demonstrated reasonable agreement with the measurement results and good ultra-wideband linear transmission performance has also been achieved in the time domain.

**ICIRIST-IRP-084**

# Powered Counterfeit product detection system using Blockchain

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## ABSTRACT

Product tracking using blockchain technology involves creating a tamper-proof and immutable record of a product's journey from its creation to its delivery. This can be achieved by creating a digital ledger that records every step of the product's journey, from its origins to the point of sale. Using blockchain technology for product tracking can provide a number of benefits, including increased transparency and accountability, reduced fraud, and improved efficiency. The use of blockchain technology can help prevent the production and distribution of counterfeit products by creating a secure and transparent supply chain. One of the keyfeatures of blockchain technology is its ability to create a decentralized ledger of all transactions that occur within a given network. Each transaction is verified by a network of nodes, making it nearly impossible to tamper with or manipulate the data stored on the blockchain .

## Keyword

Counterfeit product, Decentralized ledger , Cryptographic hashes

**ICIRIST-IRP-085**

# INTEGRATING IMPROVED VANET SECURITY OF ACCIDENT AND DRINK & DRIVE TRAFFIC MONITORING SYSTEM

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## ABSTRACT

This project aims to address the critical issue of individuals being left without assistance while riding their vehicle. With the implementation of an accident detection and alert system, this project seeks to provide a solution to this problem.The system utilizes an Arduino, GPS Receiver, and GSM module to control the entire process. The GPS Receiver identifies the vehicle's direction, while the GSM module sends an SMS containing the directions and a link to Google Maps to the assigned contact. The system can detect severe accidents using a Vibration sensor and can also identify rollovers.The microcontroller sends this information to the GSM module, which transmits the data, including the victim's precise location, to the assigned contact. The contact can then use the GPS MODEM to locate the victim and provide immediate assistance. With the rise in vehicular accidents, fatalities have also been on the rise.However, the Accident Detection and Alert System using Arduino can prevent uncertain deaths by sending a message alert to a registered mobile number, providing the precise location of the accident through a Google map link. This system is a valuable investment in ensuring the safety of drivers and passengers a like.

**Keyword**

Arduino,GSM,GPS,Accident Detection ,IoT

**ICIRIST-IRP-086**

# SMART CROP MANAGEMENT SYSTEM INTEGRATING IOT AND MACHINE LEARNING

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## ABSTRACT

An IoT-based Crop Health Monitoring and Controlling system leverages the integration of machine learning algorithms to revolutionize agriculture. In this innovative system, IoT sensors are deployed across agricultural fields to collect real-time data on various parameters such as soil moisture, temperature, humidity, light intensity, and nutrient levels. Through machine learning algorithms, this data is processed and analyzed to gain insights into crop health conditions, predict potential issues, and provide precise recommendations for optimizing crop growth. These algorithms can detect patterns, correlations, and anomalies in the data, enabling farmers to make informed decisions and take proactive measures to enhance crop productivity. Automated systems integrated with IoT can regulate irrigation based on soil moisture levels or apply fertilizers according to nutrient deficiencies detected by the sensors. The machine learning aspect of this IoT-driven system continuously learns from the incoming data, improving its accuracy in predicting crop diseases, pest infestations, or environmental stresses. Additionally, it assists in optimizing crop growth conditions by adjusting parameters such as water distribution, nutrient supply, and climate control in greenhouses or indoor farming setups.

ICIRIST-IRP-087

# DESIGN AND IMPLEMENTATION OF AN IMPROVED WATCHDOG TIMER

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## ABSTRACT

Embedded systems that are employed in safety critical applications require highest reliability. External watchdog timers are used in such systems to automatically handle and recover from operation time related failures. Most of the available external watchdog timers use additional circuitry to adjust their timeout periods and provide only limited features in terms of their functionality. This paper describes the architecture and design of an improved configurable watchdog timer that can be employed in safety-critical applications. Several fault detection mechanisms are built into the watchdog, which adds to its robustness.This paper also discusses the implementation of the proposed watchdog timer in a Field Programmable Gate Array (FPGA). This allows the design to be easily adaptable to different applications, while reducing the overall system cost. The effectiveness of the proposed watchdog timer to detect and respond to faults is first studied by analyzing the simulation results. Thus after designing the watchdog it is implemented in ATM and verified. The design is validated in a real-time hardware by injecting faults through the software while the processor is executing. A Verilog HDL-based design was used to develop the system, and a Verilog based simulation was used to create it using Xilinx ISE 14.7. Both of these were written in Verilog.

**Keyword**

Low Power VLSI; Windowed Watch Dog Timer; Memory.

**ICIRIST-IRP-088**

# `IoT - Powered Smart Garden Management For Horticulture

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## ABSTRACT

Improving agricultural production can only be achieved using innovative environmentally suitable solutions and modern agricultural technologies. Using Internet of Things (IoT) technologies in greenhouse farming allows reduction of the immediate impact of external climatic conditions. Monitoring the farm for disease detection is labour intensive and time consuming. This project will introduce the highly scalable intelligent system controlling, and monitoring greenhouse climatic condition using IoT technologies also non-image IoT devices to detect greenhouse plant diseases. Unlike the image-based plant disease detection approaches, our agriculture sensors generate non-image data that can be automatically trained and analyzed by the mechanism in real time. The first objective of this system is to monitor the greenhouse environment and control the internal temperature to reduce consumed energy while maintaining good conditions that improve productivity. The second objective is to provide the AI model is treated as an IoT device and is managed like other IoT devices. The design tries to organize various possible unstructured formats of raw data, collected from different kinds of IoT devices, unified and technology-independent fashion using the benefit of model transformations and model-driven architecture to transform data in structured form.

**ICIRIST-IRP-089**

# Li-Fi Empowered Vehicle-to-Vehicle Communication: A Path to Enhanced Road Safety and Intelligent Traffic Management

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## ABSTRACT

Li-Fi is the advanced technology of the world. This project is brief about the vehicle to vehicle communication to avoid major accidents. To enrich the mentioned feature we use the following sensors are listed as ultrasonic sensor, gas sensor, vibration sensor, normal robot mechanism, and Li-Fi Communicators. The ultrasonic sensor is used to find the distance between the vehicle in front and measuring the vibration level due to speed and road platform of the vehicle. The gas sensor is used to measuring the alcohol level of the vehicle driver and this data is sent to the nearby vehicles through the Li-Fi communicator. This cutting-edge technology involves integrating Li-Fi transceivers into vehicles, enabling them to communicate through modulated light signals. Additionally, the proposal delves into the intricacies of designing communication protocols tailored specifically for dynamic V2V scenarios, ensuring optimal performance in diverse driving environments. By exploring the potential of Li-Fi in V2V communication, the description aims to contribute to the development of intelligent transportation systems that prioritize efficiency, safety, and the advancement of connected vehicle technologies. This proposed framework envisions a future where Li-Fi plays a pivotal role in transforming how vehicles communicate, fostering a new era of smart and interconnected mobility.

**ICIRIST-IRP-090**

# MISBEHAVIOUR IDENTIFICATION MECHANISM FOR BATTERY BASED ELECTRIC VEHICLE MODEL

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**ABSTRACT**

EV Control Systems monitor, automate, and operate complex infrastructure and processes that integrate into critical EV sectors that affect our daily lives. With the increasing deployment of data network technologies in EV control systems (ICSs), cybersecurity becomes a challenging problem in ICSs. During these ICS operation dangerous attacks, like machines malfunctions, increasing ambient temperature and unwanted gas particles may be released into the air also the attacks hazards. This project based on continuous monitoring ICS parameter such as load voltage-current, load condition (no-load/over-load), temperature, humidity and gas leakage, fire detection are monitored by wireless Zigbee technology. A microcontroller based system is used for collecting and storing data and making decision accordingly the data cyber-attacks machines and environmental malfunction. Extreme environment conditions are detrimental for human health. The communication system is reliable based on Zigbee, IEEE 802.15.4 standard. This is used for transmission between the hardware circuit fitted in the local site and the remote monitoring site (computer) through wireless devices. This project focuses on the use of process analytics to detect attacks in the EV control infrastructure systems and compares the effectiveness of threshold value signature-based detection methods. The proposed work presents a pattern recognition algorithm aptly named as ''Capturing-the-Invisible (CTI)'' to find the hidden process in EV control device logs and detect Behavior-based attacks being performed in real-time. This system is highly beneficial for rescue and protection of ICS and EV workers and equipment's.

ICIRIST-IRP-091

# Optimizing High Gain in UWB Bi-Planar Yagi Antenna for Enhanced Broadband Performance

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## ABSTRACT

A novel 2-component ultra-wideband (UWB) yagi antenna apparatus based multiple-input-multiple-output (MIMO) antenna framework is introduced. A loop excitation is done by setting the half roundabout circle component on each side of the receiving antenna substrate which lessens the general size by 45% and builds the data transfer capacity. The activity recurrence of the receiving antenna is picked 8.2 GHz for focusing on wan applications, having a transfer speed in the scope of 6 GHz to 8.2 GHz. The proposed antenna component has a size of 50×80×0.76 mm3.yagi antenna has great attributes with high directional radiation, the far front-to-back proportion of 18db, least increase of 5.35 dib, and directivity of 6.7 db, isolation of 17 db, most extreme envelope co-relation coefficient (beck) estimation of 0.082 and the total efficiency of above 94.19% over the band of activity.

## Keywords

UWB ,multiple –input-multiple –output(MIMO),HFSS software.

ICIRIST-IRP-092

# Using RFID enabled Mobile Phones for Public Health in Developing Countries

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## ABSTRACT

In the last decade, Radio Frequency Identification (RFID) has become popular in so many fields from military to industry applications. RFID tags have been embedded into many various products especially in logistics sector. A tag stores individual information of its attached object and an RFID reader communicates with the tag in radio frequencies to identify the object. This object to be monitored may also be a human. In our work, RFID technology is applied in health care systems. The system supports wireless mobile communication between the RFID tags and readers. Each patient available in the system is inherently mobile and wears a bracelet integrated with a unique tag, and the readers are mobile PDA devices each including a wireless RFID reader card. The proposed application can be used to identify and monitor the patients.The system can be used to check the health condition of the patient by using three device such as Blood flow device, ESP8266 device and pressure device and also to monitor the saline droplet condition of patients in each patient's bed in rural public hospital. By installing the measuring modules in all patients' beds, the system will show saline droplet status of each patient principle. Each of us requires a periodic monitoring of vital parameters and correct treatments based on this data. These processes become even more crucial when people reach a certain age and are not capable to follow their health condition properly without a special medical personnel or sophisticated equipment to perform the monitoring. Therefore, a particular interest is focused on continuous monitoring techniques. For continuous monitoring, Atmega328 microcontroller is used. In this case several device unit is considered. Namely, ESP8266 device, Blood flow rate device, human Blood pressure device. All of devices are used only for sensing purpose. If the sensed value is equal to normal value, it stops further process. Otherwise it sends control signals to patient via Actuator.

**ICIRIST-IRP-093**

# BLINT SIGHT OBJECT DETECTION WITH VOICE FEEDBACK

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## ABSTRACT

Real-time object detection in computer vision, specifically on resource-constrained devices like the Raspberry Pi, presents a multifaceted challenge and an opportunity for transformative applications. The scope encompasses image localization for single objects and extends to the intricate task of detecting multiple objects within an image, thereby contributing to the broader field of artificial intelligence. Leveraging Convolutional Neural Networks (CNNs) within the framework of Open CV, this project addresses the dynamic and diverse realm of real-time object detection. The applications of real-time object detection are extensive and impactful, spanning domains such as video surveillance, object tracking, pedestrian detection, people counting, self-driving cars, face recognition, and sports analytics, among others. The ability to identify and track semantic objects in digital images and videos is crucial for enhancing the efficiency and intelligence of various systems. The methodology involves the integration of CNNs, a powerful tool in deep learning, with Open CV—a versatile open-source computer vision library designed for real-time applications. This combination enables the development of efficient and accurate object detection models suitable for deployment on the Raspberry Pi, a resource-constrained computing platform.

**ICIRIST-IRP-094**

# FAST TRAFFIC SIGN DETECTION USING DEEP LEARNING FOR AUTOMOTIVE APPLICATIONS

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## ABSTRACT

This research presents a novel approach for real-time traffic sign and traffic light detection using the YOLOv5 algorithm in the context of autonomous vehicle control. With the increasing demand for intelligent transportation systems, the accurate and rapid detection of traffic signs and lights is crucial for ensuring safe and efficient autonomous navigation. The proposed system employs the YOLOv5 deep learning architecture due to its efficiency in object detection tasks, particularly in scenarios demanding low latency and high accuracy. A dataset comprising diverse traffic signs and signals from various environmental conditions is curated and utilized for training and validation purposes. The methodology involves pre-processing of camera images to extract pertinent features related to traffic signs and lights. The YOLOv5 architecture is then trained on this dataset to recognize and classify different traffic signs (such as speed limits, stop signs, yield signs, etc.) and traffic lights (including red, green, and yellow signals). Evaluation of the model's performance includes metrics such as precision, recall, and F1-score, ensuring reliable and robust detection capabilities. The proposed system aims for real-time inference, enabling quick and accurate decision-making for autonomous vehicles. The implementation demonstrates promising results in terms of both detection accuracy and computational efficiency. In this research contributes to the advancement of intelligent transportation systems by offering a fast and reliable solution for traffic sign and light detection, paving the way for safer and more efficient autonomous driving.

## Keywords

YOLOV5,Traffic signals,Autonomous Vehicles

**ICIRIST-IRP-095**

# BIDIRECTIONAL FULL BRIDGE LLC RESONANT CONVERTER FOR E-VEHICLES CHARING APPLICATIONS

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## ABSTRACT

In this paper LLC based plug-in electric vehicle (PEV) on-board chargers, the battery pack voltage varies in a wide range with the change of state of charge. This makes it difficult to optimally design the pulse frequency modulated (PFM) LLC resonant converter. Besides, the voltage regulation of the LLC converter is highly dependent on the load conditions. In this paper, a modified pulse width modulated (PWM) LLC type resonant topology (PWM-LLC) is proposed and investigated in PEV charging applications. The switching frequency of the primary LLC network is constant and equal to the resonant frequency. The voltage regulation is achieved by modulating the duty cycle of the secondary side auxiliary MOSFET. Compared with the conventional LLC topology, the proposed topology shrinks the magnetic component size and achieves a wide and fixed voltage gain range independent of load conditions. The prototype demonstrates 96.7% peak efficiency and robust performance over wide voltage and load ranges.

## Keywords

Plug in Electric Vehicle, Pulse frequency modulated, resonant converter, Electric Charger.

**ICIRIST-IRP-096**

# PV BASED GRID INTEGRATED E-VEHICLE CHARGE STATION WITH IMPROVED POWER QUALITY

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## ABSTRACT

This paper presents a integration of three-phase grid charge station (CS) for E-vehicle (EV). The PV system integrates with grid which provides absolute reactive power compensation. The charge station operates in several modes (i) charging/discharging of EV battery (ii) compensation of reactive power (iii) compensation of harmonics current. Moreover, it interfaces with the utility side and supplies the remaining power. Another merits of the charge station is the balance of the reactive power to improve grid power quality. The charge station is controlled so that it operates satisfactorily even under the unbalanced grid voltages and with total harmonic distortion of grid currents. Hence the system is designed in such a way that the charging station operates in grid connected mode. . If grid losses synchronism, then charge station works in islanded mode and PV source charges the EV battery. A synchronization control is also developed to connect the system to the grid, when it is available.

## Keywords

EV, Photovoltaic(PV), MPPT, harmonic distortion, grid current and PV array

**ICIRIST-IRP-097**

# ONLINE ADAPTIVE GAIN FOR PASSIVITY-BASED CONTROL FOR SENSORLESS BLDC MOTOR COUPLED WITH DC MOTOR FOR EV APPLICATION.

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## ABSTRACT

The Passivity-based control (PBC) is an energy-based control in which total energy is an algebraic sum of stored and dissipated energy. The energy equations are analyzed using Hamiltonan operator. Exact Tracking Error Dynamics Passive Output Feedback (ETEDPOF) method is used to drive a BLDC motor coupled with dc motor. The controller is linear controllers which adaptspecieseparation by means of sensing output current as well as position of motor for varying speed reference. The system is made senseless by eliminating both position and speed sensors to reduce cost of implementation using back EMF method. The back EMF of each winding is sensed and using zero crossing detectors, the initial position is found for starting the motor. The speed is observed from back EMF and also, the gate signals are sent to inverter. The inverter is powered from single phase ac supply through dc filter and boost converter In order to verify features of proposed control scheme, PBC is compared with widely used PI controller and sliding mode control for boost converter and inverter,simulated in MATLAB and result sure observed with constant load torque and speed conditions.

**Keywords**

Smart board, Python programming, Wireless network, Air canvas etc.

**ICIRIST-IRP-098**

# MITIGATION OF VOLATAGE SAG AND SWELL USING DVR

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## ABSTRACT

Dynamic voltage restorer (DVR) is a method of overcoming power quality issues namely voltage sags and swells that occur in electrical power distribution.These are a problem because spikes consume power and sags reduce efficiency of some devices. DVR saves energy through voltage injections that can affect the phase and wave-shape of the power being supplied.The basic principle of dynamic voltage restorer is to inject a voltage of the magnitude and frequency necessary to restore the load side voltage to the desired amplitude and waveform, even when the source voltage is unbalanced or distorted. Generally, devices for dynamic voltage restoration employ gate turn off thyristors, (GTO) solid state power electronic switches in a pulse-width modulated (PWM) inverter structure. The DVR can generate or absorb independently controllable real and reactive power at the load side. In other words, the DVR is a solid state DC to AC switching power converter that injects a set of three-phase AC output voltages in series and synchronicity with the distribution and transmission line voltages. The source of the injected voltage is the commutation process for reactive power demand and an energy source for the real power demand. The energy source may vary according to the design and manufacturer of the DVR, but DC capacitors and batteries drawn from the line through a rectifier are frequently used. The energy source is typically connected to the DVR through its DC input terminal. DVRs may provide good solutions for end-users subject to unwanted power quality disturbances. However, they are generally not used in systems that are subject to prolonged reactive power deficiencies (resulting in low voltage conditions) and in systems that are vulnerable to voltage collapse. Because DVRs will maintain appropriate supply voltage, in such systems where incipient voltage conditions are present they actually make collapses more difficult to prevent and can even lead to cascading interruptions.DVR compensates the unbalance in supply voltage of different phases. Also, DVRs are usually installed on a critical feeder supplying the active power through DC energy storage and the required reactive power is generated internally without any means of DC storage.Therefore, when applying DVRs, it is vital to consider the nature of the load whose voltage supply is being secured, as well as the transmission system which must tolerate the change in voltage-response of the load. It may be necessary to provide local fast reactive supply sources in order to protect the system, including the DVR, from voltage collapse and cascading interruptions.

**Keywords**

Dynamic voltage restore, sag, swell, and power quality

**ICIRIST-IRP-099**

# GRID-INTERACTIVEPOWER CONVERTERS

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## ABSTRACT

In this article, various converters integrated with renewable sources to the utility Grid along with its control strategies are proposed. The proposed system uses a buck–boost Converter to extract maximum power from photovoltaic (PV) and maintain power balance Between the system and utility grid through a voltage source converter (VSC) employing Bidirectional power flow. The main feature of the buck–boost converter presented here is to Boost the dc voltage of the load by integrating the PV and dc output of the VSC in series.Moreover, the boost converter is utilized to extract the maximum power from a wind source.Additionally, a voltage management scheme is proposed to achieve a regulated constant Voltage magnitude higher than that of a conventional voltage source converter integrated With the utility grid. Besides, it can be realized using a conventional voltage source converter Along with the existing renewable sources in the system. Finally, the proposed system is Validated through simulation and experimental results under various operating conditions.

## Keyword

Voltagecontrol,Topology,Switches,Inductors,Controlsystems,Energy storage,Radiation effects.

**ICIRIST-IRP-100**

# A comparative analysis of power electronics converter for ultra-fast charging in EV application

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## ABSTRACT

The concern about climate change and greenhouse gas emissions has resulted in a steady shift in the transportation sector from conventional fossil fuel-based combustion vehicles to electric vehicles (EVs). In the last decade only, the growth of EVs on the road has increased exponentially. So, the desired energy availability and charging infrastructure in multi-energy systems must be in place to support this mass adoption. However, the major drawback of EVs is their range anxiety. In the case of EV charging from a low-voltage network, the charging time is high, and the operational capabilities are poor because of the uneven load dynamics of EV charging. Thus, ultra-fast charging (UFC) solves this problem and makes EVs a worthwhile investment for both manufacturers and customers. A UFC infrastructure replicates the refuelling network of a conventional-based combustion vehicle by reducing the charging time to the range of 5 to 10 min. This paper presents a technological review of an ultra-fast charging station (UFCS), including a comprehensive analysis of two power electronic conversion stages: AC/DC and DC/DC. The converters utilized for UFC are compared on the basis of current trends, technical advancements, control, and converter topology. The comprehensive survey of each aspect of the UFCS is done.

## Keywords

Electric Vehicle, Ultra fast charging, etc.

**ICIRIST-IRP-101**

# IOT BASED BATTERY MONITORING SYSTEM IN ELETRIC VEHICLE

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## ABSTRACT

As electric vehicles become more popular, it's crucial to monitor the health and performance of their batteries to ensure optimal efficiency and longevity. In this paper, we propose an IoT-based battery monitoring system that leverages wireess communication and cloud computing to collect and analyze battery data in real-time. Our system consists of three main components: battery sensors, a gateway device, and a cloud platform. The battery sensors are placed in each battery cell to measure key parameters such as voltage, current, temperature, and state of charge. These sensors transmit data wirelessly to the gateway device, which aggregates and processes the data before sending it to the cloud platform.Our system offers several benefits, including improved battery performance, reduced maintenance costs, and enhanced safety. By leveraging IoT and cloud technologies, we can provide real-time monitoring and analysis of battery data, enabling more informed decision-making and proactive maintenance. Regarding regenerative braking, the energy generated through this process can indeed serve as an additional power storage method, complementing the main battery storage system. This stored energy can be used to enhance the overall efficiency and performance of the vehicle's power system.

## Keywords

Battery Sensor, Battery Storage ,IoT cloud Technology

**ICIRIST-IRP-102**

# Design and modelling of Active Quasi Z-Source Multilevel Inverter With High Gain Boost

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## ABSTRACT

This paper proposes a three-level diode clamped active impedance source inverter (AIS-TLI) based on the quasi Z-source inverter (qZSI). Apart from having minimal components and the inherent benefits of three-level qZSIs, such as single-stage buck-boost capability, shoot-through (ST) immunity, and continuity of input current, the proposed topology has a higher boost capability and excellent efficiency .In addition, the inverter bridge has a higher modulation index, which improves the quality of the output waveform and necessitates less inductance. The proposed topology provides common ground between input and output terminals, which effectively eliminates leakage current in PV-powered single-phase systems .This paper describes the different operating modes principle, dynamic analysis, steady-state analysis, and parameter selection instructions for the proposed in-depth. Furthermore, the suggested inverters benefits and limitations are compared to the traditional (q)ZSIs and some other AIS-TLIs. Finally, modeling and experimental results are used to confirm the effectiveness of the suggested topology.

**ICIRIST-IRP-103**

# DEVELOPMENT AND IMPLEMENTATION OF AIRCANVAS BASED WIRELESS SMART BOARD USING PYTHON

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## ABSTRACT

The writing in air has been one of the most fascinating and challenging researchareas in field of image processing and pattern recognition in the recent years. It contributes immensely to the advancement of an automation process and can improve the interface between man and machine in numerous applications. Several research works have been focusing on new techniques and methods that would reduce the processing time while providing higher recognition accuracy. Object tracking is considered as an important task within the field of Computer Vision. The invention of faster computers, availability of inexpensive and good quality video cameras and demands of automated video analysis has given popularity to object tracking techniques.For object tracking, four different issues are taken into account; automatic surveillance, video indexing and vehicle navigation etc. The project takes advantage of this gap and focuses on developing a motion-to-text converter that can potentially serve as software for intelligent wearable devices for writing from the air. This project is a reporter of occasional gestures.. The generated text can also be used for various purposes, suchas sending messages, emails, etc.

## Keywords

Smart board, Python programming, Wireless network, Air canvas etc.

**ICIRIST-IRP-104**

# SOLAR PV ARRAY-FED BLDC MOTOR FOR LUO CONVERTER BASED WATER PUMPING SYSTEM

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## ABSTRACT

This paper discusses the solar photovoltaic (SPV) array fed water pumping system that uses a permanent magnet brushless DC (BLDC) motor to drive a centrifugal water pump and a Luo converter as an intermediary DC-DC converter. An elementary Luo converter is chosen from among the several kinds of DC-DC converters in order to safely start the BLDC motor and collect the most power possible from the SPV array. The basic Luo converter with fewer parts and a single semiconductor switch is inherently capable of minimizing output current ripples and having an infinite range for maximum power point tracking (MPPT). The voltage source inverter (VSI), when used in conjunction with the electronically commutated BLDC motor, operates at fundamental frequency switching, preventing high frequency switching losses and enhancing system efficiency. The SPV array is made to ensure that, under typical test conditions, the BLDC motor-pump receives power at the rated DC voltage and that the maximum switch utilization of the Luo converter is reached, improving the converter's efficiency. MATLAB/Simulink based simulation results are used to demonstrate the appropriateness of the proposed system and to examine performances at different operating situations, including beginning, dynamic, and steady state behavior.

## Keywords

centrifugal water pump, BLDC motor, MPPT, switch usage, SPV array, and Luo converter.

**ICIRIST-IRP-105**

# Charles Dickens Great Expectations and Hard Times

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**ABSTRACT**

Charles John Huffam Dickens was an English writer and social critic. He created Some of the world's best-known fictional characters and is regarded by many as the greatest novelist of the Victorian Era. His works enjoyed unprecedented popularity during his life time, and by the twentieth century critics and scholars had recognized him as literary genius. His novels and short stories are still widely read today. Charles Dickens Great Expectations was heavily indebted to Marxist theory. In Marxist ideology Class was broadly divided into different categories Such as Proletariat, bourgeoisie and middle class. He also presented Class consciousness among the chief. character. class mobility which was a staple in the Victorian Society was very much apparent in this novel. It demonstrated the corrupting influence of money in modern Capitalistic society. There fore, dehumanization of men, women, and children by the upper Strata of society was a common feature. This research aims at showing the way in which a the Specific reader Period a clear of time, image It of was the also society aimed of at explaining and pointing out a major function of literature which was mirroring Society, it proved that literature was not just a collection of fictitious stories based On imagination and written for entertaining readers it was based on realities and facts covered sometimes by fiction , The research work would try to find out the social class differences in Dickens's Hard Times and to show whether it reflected a social realities from the Victorian Society.

**ICIRIST-IRP-106**

# Effect of Black Coffee Supplementation on Probiotic Potential, Physical- Chemical and Functional Properties of Yogurt

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## ABSTRACT

The study concentrated on the probiotic potential, physical, chemical, and functional characteristics of yoghurts as well as the impact of a black coffee supplement. Cow milk was used to make the yoghurt, and it was supplemented with various amounts of black coffee extract (0%, 2.5%, 5%, and 7.5%). The physicochemical characteristics, such as pH, titratable acidity, total solids, and total protein, were examined during storage for 21 days. The vitality of Bifidobacterium bifidum and Lactobacillus acidophilus during storage was used to gauge the probiotic potential. The findings demonstrated that the physicochemical and functional characteristics of yoghurt were significantly impacted by the addition of black coffee extract. With increasing concentrations of black coffee extract, the pH decreased significantly ($p < 0.05$), whereas the titratable acidity increased significantly ($p < 0.05$). The yoghurts' ability to hold both water and oil increased significantly ($p < 0.05$) with increased concentrations of black coffee extract. The addition of black coffee extract to the yoghurts did not impact the viability of Lactobacillus acidophilus and Bifidobacterium bifidum during the first seven days of storage. The vitality of both the strains was considerably higher ($p < 0.05$) in the yoghurt mixed with black coffee extract than in the control after 14 and 21 days of storage. The physicochemical and functional qualities of yoghurt were greatly enhanced by the addition of black coffee extract to cow milk without altering the probiotic potential. As a result, black coffee extract has the potential to be a component of functional yoghurt with increased health advantages.

## Keywords

Black coffee extract, yoghurt, probiotic potential, physicochemical properties, functional properties

**ICIRIST-IRP-107**

# OPTIMIZATION AND BLENDING OF PLANT EXTRAT TO PREPARE NUTRITIOUS SWEET POTATO NOODLES

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## ABSTRACT

Sweet potato noodle is a popular food item in many parts of the world. The composition of noodles is boiled sweet potato and wheat flour in the ratio of 50:50 and the leaf extract is used instant of water. Then nutritional value of sweet potato noodles was improved by adding leaf extracts from different plants that have medicinal properties. The medicinal leaf (Moringa leaf, Guava leaf) are chosen for their potential to assist in the management of diabetes. The study examines the effects of adding the medicinal leaf extracts on the sweet potato noodle's nutritional composition. The glycemic index, antioxidant capacity, mineral content, and macronutrient composition of the sweet potato noodles are examined. The study also evaluates the effects of the medicinal leaf extracts on the sensory properties of the sweet potato noodles, such as texture, flavor and color. The study's findings will be helpful in understanding how medicinal leaf extracts might improve the nutritional profile of sweet potato noodles and offer diabetics an excellent food option.

**Key words**

Sweet potato noodles, Medicinal leaf extracts, Diabetics, Sensory properties.

**ICIRIST-IRP-108**

# EXPLORING THE ANTIBACTERIAL AND ANTIOXIDANT POTENTIALS OF ARTEMISIA ANNUA EXTRACTS

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## ABSTRACT

Artemisia annua belongs to the plant family of Asteraceae and is an annual Short -day plant, commonly known as sweet wormwood, had been recognized for its medicinal properties like antimalarial , anti-inflam-matory , antitumour and allelopathetic .The antibacterial and antioxidant potentials of extract derived from Artemisia annua extraction process involves employing various solvents to obtain bioactive compounds from different parts of the plant, such as leaves and stem. The aqueous extract of Artemisia annua L. can replace antibiotics and stimulate the growth of the body while also improving the growth performance and antioxidant function . This essential oil extracted from the aerial portions of Artemisia annua was tested. The oil contained the following components: camphor (44%), germacrene D (16%), trans-pinocarveol (11%), b-selinene (9%), b-caryophyllene (9%) and artemisiaketone (3%).This essential oil significantly reduced the development of both tested fungus and tested Gram-positive bacteria, Enterococcus hirae.

## Key words

Artemisia annua, Oil extraction, Antibacterial, Antioxidant, Bioactive.

**ICIRIST-IRP-109**

# OVERVIEW ON METAL PACKAGING IN THE FOOD INDUSTRY

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## ABSTRACT

Metal packaging protects the food products from any external factors during thermal treatment and storage. The hermetic seal of the container is the basic need for metal packaging. Metals are used in making food contact sources like saucepans and coffee pots, and packaging. Different packaging forms and closures are used for glass bottles and composite cans. Migration of bisphenol A, lead, aluminium, iron, nickel, blackening, tin dissolution, corrosion, and bulging of cans are the major health problems. Metals may interact with the food products to avoid the metal-food interaction and migration of metal components coating with protective enamels are usually done. Coronavirus is a life- threatening infectious disease that causes respiratory problems, which is a worldwide public health concern. Currently, vaccines are used to prevent this coronavirus from spreading. Control measures depend mainly on preventing the spread of the virus from person to person by social distancing, and wearing gloves and masks are strictly followed. There is also increasing demand regarding the shortage of metals in the supply chain. In the first wave of the covid-19 pandemic, the consumers' usage of canned foods increased by the consumers due to the fear of continued lockdowns and the wrapped food using aluminum foil. This hits the can manufacturing shortages as the country-to-country lockdowns where the metals used for making containers need to be exported from China. Another problem is the bulk purchasing of non- perishable, canned food products, mainly ready-to-eat meals, soups, and prepared meats, due to the pandemic shutdown. Since there is a supply chain problem due to the Covid-19, this may lead to longer lead times leading to true shortages. An overview of metal packaging in the food industry and its impacts during the COVID-19 pandemic is discussed.

## Keywords

Metal Packaging, Packaging Forms, Can Coatings, Migration, COVID-19.

**ICIRIST-IRP-110**

# Bioactive Compound and Medicinal value of Psidium Guajava (Guava) – Review

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## ABSTRACT

The well-known guava fruit, *Psidium guajava*, is green in color and turns yellow when ripe. The fruit's carbonyl compound gives it a good aromatic sense. The seeds are chewable and a good source of pectin. Thirty types of guavas grow in India; the main guava-producing regions are in West Bengal. This has a diameter of 5–10 cm and a weight of 100–250 g. The leaves are hermaphrodite, and the flowers are solitary. The tree reaches a height of 25 feet. The fruit contains essential nutrients for human health, such as fiber, which helps treat diabetes and diarrhea. The leaf has some swollen gum wounds and coughs. Guavas are rich in iron, minerals, vitamins A and C, and other nutrients. Sperm quality and quantity can be increased by guava ethanolic extract. The review of the pulp and peel fraction testing indicates that the plant leaves' aqueous extract contains antiviral compounds like pinene and terpinene, polyphenols, and antioxidants like phenols and ascorbic acid. These components also exhibit antimicrobial, anticancer, antidiabetic, antioxidant, antidiarrheal, lipid-lowering, and hepatoprotective properties. Because of the chemicals in *Psidium guajava* that have positive effects on health and disease prevention, it is regarded as a nutraceutical. Thus, the purpose of this research is to review the reported applications of the various guava processing by-products as well as their bioactive compound makeup.

**Keywords**

Carbonyl compound, *Psidium guajava,* Antidiarrheal, Antidiabetic, Antioxidant

**ICIRIST-IRP-111**

# Exploring Deep Learning: In-Depth Insights into Techniques, Taxonomy, Applications, and Research Directions

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## ABSTRACT

Deep learning (DL), a subset of machine learning (ML) and artificial intelligence (AI), is now recognized as a fundamental technology in today's Fourth Industrial Revolution (4IR or Industry 4.0). Originating from artificial neural networks (ANN) and distinguished by its ability to learn from data, DL has become a prominent focus in the field of computing. Its applications span diverse areas, including healthcare, visual recognition, text analytics, cybersecurity, and more. However, constructing an effective DL model is a formidable task due to the dynamic nature and variability inherent in real-world problems and data. Additionally, the lack of a foundational understanding often transforms DL methods into opaque "black-box" systems, impeding development at the standard level. This article offers a structured and comprehensive perspective on DL techniques, featuring a taxonomy that encompasses various real-world tasks such as supervised or unsupervised learning. The taxonomy considers deep networks for supervised or discriminative learning, unsupervised or generative learning, as well as hybrid learning and other relevant approaches. Real-world application areas where deep learning techniques find utility are also summarized. Furthermore, the article identifies ten potential aspects for the future generation of DL modeling, providing research directions. Overall, this article endeavors to present a holistic view of DL modeling, intended as a reference guide for both academia and industry professionals.

ICIRIST-IRP-112

# Blockchain-Powered Intruder Identification in IoT Networks: Methodology and Implementation

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## ABSTRACT

As the Internet of Things (IoT) continues to expand, securing the network against intruders becomes a critical challenge. This paper explores the innovative application of blockchain technology for identifying and mitigating intruders within IoT networks. The methodology employed integrates blockchain's decentralized and immutable ledger capabilities to enhance security measures. The proposed approach involves the use of smart contracts deployed on a blockchain network to monitor and validate device interactions within the IoT ecosystem. Each IoT device is assigned a unique identity stored on the blockchain, ensuring a tamper-resistant record of device activities. In the event of suspicious behavior, the smart contracts autonomously trigger alerts and initiate response protocols. A scenario illustrates the effectiveness of this methodology: Consider a smart home environment equipped with various IoT devices, from smart thermostats to security cameras. Through the implementation of blockchain, each device is registered on the blockchain network, forming an interconnected web of trust. If an unauthorized user attempts to manipulate a device or gain unauthorized access, the blockchain's immutable ledger records and broadcasts the anomaly. The methodology presented demonstrates the potential for blockchain to revolutionize IoT security practices, ensuring the integrity and trustworthiness of connected devices in an increasingly interconnected world.

## Keywords

Internet of Things; Blockchain; smart contract; immutable ledger; intruder

**ICIRIST-IRP-113**

# SPEECH EMOTION RECOGNITION USING DEEP LEARNING TECHNIQUES

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## ABSTRACT

The detection and classification of emotional states in speech involves the analysis of audio signals and text transcriptions.Spatial and temporal features have been extracted sequentially in deep learning-based models using convolutional neural networks (CNN) followed by recurrent neural networks (RNN) which may not only be weak at the detection of the separate spatial-temporal feature representations but also the semantic tendencies in speech. In this paper, we propose a deep learning-based model named concurrent spatial-temporal and grammatical (CoSTGA) model that concurrently learns spatial, temporal and semantic representations in the local feature learning block (LFLB) which are fused as a latent vector to form an input to the global feature learning block (GFLB).The proposed CoSTGA model uses multi-level fusion first at the LFLB level where similar features (spatial or temporal) are separately extracted from a modality and secondly at the GFLB level where the spatial-temporal features are fused with the semantic tendency features. The proposed CoSTGA model uses a combination of dilated causal convolutions (DCC), bidirectional long short-term memory (BiLSTM), transformer encoders (TE), multi-head and self-attention mechanisms.

**ICIRIST-IRP-114**

# REALTIME MULTICASTING WITH NETWORK CODING AND HYBRID ALGORITHM IN MOBILE AD-HOC NETWORK

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## ABSTRACT

The data transfer to the basis to the destination has more efficiently in the Mobile Ad-hoc Network, but the main thing in the MANET is the data should be reached the target with full format (without any packet loss). The package forwarding time between the sources to destination these are thinks should be managed using some techniques. A Network Coding based Real-time Multicast (NCRM) protocol is future for real-time multicast services in Mobile Ad-hoc Networks MANET. Through reducing the forwarding times for data packets in MANET, NCRM can not only lessen the energy consumption, but it also improves the throughput performance. NCRM outperforms Protocol for Unified Multicasting from end to end Announcement (PUMA) and Multicast Ad-hoc on-demand Distance Vector (MAODV) for increasing transmission reliability and energy use significantly. Hybrid algorithm is used for efficient data encryption and decryption for improving the security; stream cipher &block cipher are combined to get a secured HYBRID cipher text.

## Keywords

Multicast Ad-hoc On-demand Distance Vector (MAODV), Protocol for Unified Multicasting throughout Announcement (PUMA), Network Coding based Real-time Multicast (NCRM)

ICIRIST-IRP-115

# CROWDFUNDING APPLICATION IN WEB3 USING BLOCKCHAIN TECHNOLOGY

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## ABSTRACT

Crowdfunding serves as a funding avenue for diverse ventures, allowing founders to request funds for profit, non-profit, or social causes, often exchanged for future products or equity. In the digital age, social media platforms connect investors with entrepreneurs, fostering capital rising for various projects. Current Crowdfunding methods lack control for fundraisers and contributors, leading to issues like scam startups, intellectual property risks, and high fees. This project introduces a Blockchain-based Crowdfunding network, leveraging smart contracts to offer a private, secure, and decentralized funding approach. By automating contract execution, the platform aims to prevent fraud and establish a robust relationship between fundraisers, contributors, and the platform. This application stands out by assuring backers of guaranteed returns, going beyond traditional investment platforms. With a commitment to transparency, backers can stay informed about the progress of their invested funds in respective startups, addressing concerns and enhancing the Crowdfunding experience.

**ICIRIST-IRP-116**

# Virtualized Cloud Access Management System using Intelligent Genetic Algorithm

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## ABSTRACT

Virtualization is major factor to provide provisioned Cloud services. Current scenario various services can be used based on demand and requirements. We need uninterrupted and fully accessed cloud deployed model. At the same load balancing is another major concern about setting cloud environment. Multiple Virtual machines are working parallely to provide services. Intelligent genetic algorithm is used to provide provisioned Cloud resources based on request, demand and access previlages. At the same execution time and turnaround is also measured which means efficient way use the services. From the multi objective environment we need to set high configurated and efficient manageable system to control the services. Here we applied deep learning techniques to predict the accuracy of demand based services.

## Keywords

On-demand, Virtualization, Cloud Services, Cloud deployment, Accuracy

**ICIRIST-IRP-117**

# IOT EVOLUTION: INVESTIGATING RESEARCH CHALLENGES AND EMERGING APPLICATIONS

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**ABSTRACT**

The advent of the Internet of Things heralds a paradigm shift in the evolution of the digital landscape, presenting a multitude of applications across diverse domains. From revolutionizing smart cities to optimizing healthcare, agriculture, logistics, retail, and transforming living spaces, IoT is on the cusp of ubiquitous integration into our daily lives. Despite commendable strides in IoT technologies, persistent challenges necessitate concerted research efforts. This amalgamation of diverse technologies gives rise to multifaceted research challenges that span the realms of information technology and computer science. This paper delves into the recent advancements within the IoT landscape, shedding light on the dynamic developments that underpin its transformative journey. It goes beyond the current state to envision future applications, exploring uncharted territories that IoT is set to explore. By examining the existing challenges, the paper aims to catalyze research endeavors that will further propel the capabilities of IoT. The expansive scope of IoT, permeating nearly every facet of human existence, not only underscores its significance but also positions it as a focal point for interdisciplinary research. Consequently, this exploration into IoT's recent developments serves as a springboard for unlocking new dimensions in research, paving the way for innovative solutions to shape the future of connected ecosystems.

**Keywords**

Internet of Things (IoT), Digital landscape, Smart cities, Healthcare optimization, Agricultural transformation, Logistics innovation, Retail applications, Ubiquitous integration, Diverse technologies

**ICIRIST-IRP-118**

# Credit Risk Prediction Model Using Machine Learning Algorithms

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## ABSTRACT

Deep learning has gained importance in exhibiting good performance in diverse fields like computer vision and image recognition. This study explores integrating deep learning techniques into consumer credit scoring, a vital component of credit risk management in the rapidly expanding consumer finance industry. Various data mining approaches have been proposed and applied, with a focus on gaining the advantages of deep learning for enhanced credit scoring accuracy. The paper aims to harness the potential of these techniques, aligning them with the evolving landscape of credit risk assessment. Credit risk analysis is used to differentiate between good and bad applicants, which will help to reduce the bank loss. Through a comparative analysis, this research paper involves the utilization of diverse data sources, including financial indicators, customer behavior patterns, and macroeconomic factors. Based on the analysis of credit risk prediction model, can able to save our Indian economy from the huge economical crisis, which will otherwise negatively impact on our economy. This study suggests an better predictive accuracy algorithm by analyzing the various machine learning algorithms like SVM, Naïve Bayes, KNN and ANN. The findings suggest that employing the ANN with sampling technique enhances the performance of the credit risk prediction model. The ANN, under this sampling approach, demonstrates an impressive accuracy of 97%. This study provides valuable insights into the effective utilization of neural networks and neurons within the proposed algorithm, shedding light on their synergistic relationship with sampling techniques and offering a deeper understanding of their functioning.

**ICIRIST-IRP-119**

# Dynamic and Extendable Indicator for Locating the Shortest Route on Road Networks

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## ABSTRACT

The collective spatial keyword query (CSKQ), a significant variant of spatial keyword queries, aims to identify a set of objects that collectively cover users' queried keywords. These objects should be close to the query location and have minimal inter-object distances. While existing research primarily addresses the CSKQ problem in the Euclidean space, it is apparent that, in many real-life applications, the proximity of two spatial objects is measured by their road network distance. Thus, current methods are insufficient for efficiently addressing the network-based CSKQ problem. In this paper, we investigate the challenge of processing collective spatial keyword queries on road networks, where objects are situated on a predefined road network. We first establish the NP-completeness of this problem and then introduce two approximate algorithms with provable approximation bounds, along with one exact algorithm, to efficiently support CSKQ on road networks. Extensive experiments using real datasets validate the efficiency and accuracy of our proposed algorithms.

**ICIRIST-IRP-120**

# AI REVALUATION IN BUSINESS AND MANUFACTURING IN MODERN SCENARIO

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## ABSTRACT

Artificial Intelligence (AI) is fundamentally transforming the landscape of business and production, ushering in an era of unprecedented efficiency and innovation. In the realm of business, AI is a powerful ally in data analysis, enabling companies to extract valuable insights from vast datasets, facilitating informed decision-making. Additionally, AI-driven customer engagement, often facilitated through chatbots, enhances interaction and responsiveness, leading to improved customer satisfaction.In the production sector, AI plays a pivotal role in revolutionizing traditional manufacturing processes. Automation, powered by AI, is optimizing workflows, reducing manual labor, and enhancing overall productivity. Predictive maintenance, another AI application, minimizes downtime by forecasting potential equipment failures, allowing proactive interventions.The integration of AI technologies translates into tangible benefits such as cost savings, streamlined operations, and enhanced competitiveness. As businesses leverage AI to navigate the complexities of the modern landscape, and production processes evolve with intelligent automation, the synergy between AI and industry continues to reshape traditional paradigms, fostering a more agile and responsive ecosystem.

**Keywords**

AI, business transformation, production optimization, data analysis, decision-making, automation, inventory management, cost savings.

**ICIRIST-IRP-121**

# A STUDY ON ONLINE CUSTOMER RELATIONSHIP MANAGEMENT PRACTICE TOWARDS CUSTOMERS' SATISFACTION IN SUPER MARKET-ARIYALUR

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**ABSTRACT**

Customer Relationship Management (CRM) is an enterprise-broad business strategy practice directed at attracting, retaining and effectively serving customers to grow up their state of values over the long term. Developing business is never end process and CRM is playing a vital role in success of the business. It is not an exemption. CRM is quite a new phenomenon in retailing industry. The purpose of the study is satisfaction level of customers of the respective super market and finally to determine the relationship between CRM practices adopted by the super market and loyalty of their customers. The study conducted Tiruchirappalli district with 200 respondents, and each 50 respondent from selected four super markers (FSM, Reliance, Kavery, Kumudham) stores. The study was descriptive in nature so questionnaire method was adopted. The result shows that, increasing CRM practices in retail industry will be have bright future with role in providing better quality services to understand which built customer satisfaction and fulfill their expectation.

**Keywords**

CRM practices, Retail Industry, customer satisfaction.

**ICIRIST-IRP-122**

# MUTUAL FUND TREND ANALYSIS IN INDIAN CAPITAL MARKET

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**ABSTRACT**

Mutual fund industry has experienced a drastic growth within the past twenty years. Increase within the number of schemes with increased mobilization of funds in the past few years provide benefits to the importance of the Indian mutual funds industry. Mutual funds have a number of schemes within it, such as large cap, Mid cap and Small cap funds, which makes it hard for the investors to choose the best scheme out of so many available options. This Study specifically focused on the performance analysis of mutual fund schemes based on the Large cap, Mid cap and Small cap, which helps investors to take decision based on risk and returns in current time. These mutual funds individually using different tools such as Annual returns, Standard Deviation, Beta, Sharpe's Ratio, Treynor's Ratio, Jensen's Alpha Ratio.

**ICIRIST-IRP-123**

# VERTEX-MAGIC LABELING OF CYCLE GRAPH

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**ABSTRACT**

The theory of graphs has a definite starting place in a paper published in 1736 by the Swiss Mathematician Leonhard Euler .Graph labelings were first introduced in the late 1960's and more than 1000 papers have appeared. The vertices of a graph can be labeled in many different ways. Another way to label vertices is with numbers. An interesting vertex labeling with numbers is vertex-magic. Vertex- magic graphs are graphs labeled with numbers in which every vertex and its incident edges add up to the same number. This number is called the magic number. This dissertation entitled "Vertex-magic labeling of cycle graph" consists of some Basic definitions and its Examples are described.The concept of bounds for the magic number is discussed.The Algorithms for vertex-magic labeling are explained.We construct another possible labeling for odd vertex magic cycle graphs which will assign the odd and even numbers on the vertices.

**ICIRIST-IRP-124**

# CONSTRAINED FUZZY ARITHMETIC APPROACH TO SOLVE FULLY FUZZY TRANSSHIPMENT PROBLEM

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## ABSTRACT

Transportation is the distribution of goods and resources from one place to another. Transportation problem deals with a single or multiproduct manufactured at different plants to different warehouses. Sometimes the promised quantity of a product may not be available at the exact amount for some reasons at time of delivery. Most of the solving techniques for solving fully fuzzy mathematical program are based on the standard fuzzy arithmetic operations. The constrained fuzzy arithmetic concept generates the efficient solutions for many real life applications. Transshipment problem is an extension of the transportation problem, shipping from a source to another source, shipping from a destination to another destination and shipping from a destination to any source may be allowed. This paper proposes a fuzzy constrained arithmetic approach to minimize the cost of fuzzy transportation. This paper presents an efficient algorithm for solving transshipment problem using fuzzy constrained arithmetic approach. At first convert the transportation problem into equivalent transshipment problem and then solve it by using constrained fuzzy arithmetic algorithm. This novel method gives the minimum cost for the transshipment problem.

**Keywords**

Transportation problem, constrained fuzzy arithmetic approach, Transshipment problem, fuzzy transportation

**ICIRIST-IRP-125**

# GALOIS THEORY

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**ABSTRACT**

"Algebra" is one of the oldest branches in the history of mathematics that deals with number theory, geometry and analysis. In mathematics, a field is a set on which addition, subtraction, multiplication and division are define and behave as the corresponding operations on rational and real numbers do. It is in some sense, symmetry of the object, and a way of mapping the object to itself while preserving all of its structure. In this paper, we study "Galois theory" and discuss some applications. Galois Theory is concerned with symmetries in the roots of a polynomial ($x$).Fundamental Theorem of Galois theory of equations and the ancient Greek problems were initial motivations. We discuss also in detail Galois Theory of polynomials of degrees up to 4 first, where we recall how formulae similar to those arising in the solution of quadratic equations exist for degrees 3 and 4 also. We describe the fundamental theorem of Galois Theory and show how to draw important consequences like: The three Greek problems, the impossibility of such formulae for roots to exist for general polynomials, the fundamental theorem of algebra. There are numerous applications of Galois theory which are not so well known as to appear in any text books we will look at a couple of non – standard applications in the area of number theory which are solved using Galois theory.

**Key words**

Galois Theory, symmetries, rational, polynomials

**ICIRIST-IRP-126**

# A Fuzzy Inventory Model without Shortage by Using Triangular Fuzzy Numbers with Sensitivity Analysis

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**ABSTRACT**

The inventory control is very important field for both real world applications and research purpose. Our goal is to determine the optimal total cost and the optimal order quantity for the proposed inventory model. The Triangular fuzzy numbers have been introduced in order to achieve this goal. The computation of Economic Order Quantity (EOQ) is carried out through defuzzification process by using signed distance method. The signed distance method is more applicable than the other methods of defuzzification. Sensitivity for this model is also studied, which shows a linear relation between demand, EOQ, and total cost. The proposed approach is that it is simple, gives a better result in relatively less computational work.

**Keywords**

Inventory Control, Triangular Fuzzy Numbers, Sensitivity Analysis Economic Order Quantity.

**ICIRIST-IRP-127**

# ELEMENTARY NUMBER THEORY WITH APPLICATION: CRYPTOLOGY

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**ABSTRACT**

"Algebra"is an important branch of mathematics with relevance and applications to almost all the fields.This thesis is an attempt to study Q-fuzzy subgroups and anti-Q-fuzzy subgroups in Universal algebra. The first part of the thesis deals with some properties of Q-fuzzy subgroups and second part deals with some properties of anti Q-fuzzy subgroups. In this paper we deals with some basic definitions with some examples required to develop the thesis. This Contains about Q-fuzzy subgroups. Give a group (G,.) and a non-empty set Q, a Q-fuzzy subset A of G is called a Q-fuzzy subgroup (QFSG) of G. we will discuss with some properties of Q-fuzzy normal subgroups and cosets. A Q-fuzzy subgroup A of G is said to be a Q-fuzzy normal subgroup of G if A (xy, q) = A (yx,q) for all x and y in G and q in Q. For any a in G, aA defined by (aA) (x,q)=A ($a^{-1}$x,q), for every X in G and q in Q, is called a Q-fuzzy coset of G.Deals with anti-Q-fuzzy subgroups and anti-Q-fuzzy normal subgroups. A Q-fuzzy subset A of G is said to be an anti-Q-fuzzy subgroup (AQFSG) of G.

**ICIRIST-IRP-128**

# A STAR COLORING OF GRAPHS

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**ABSTRACT**

"Graph Theory" is an important branch of mathematics with relevance and applications to almost all the fields. Problems related to life, mathematics, science, engineering, and even puzzles can be diagrammatically represented by points on a plane and joining a few pair of the points with lines. Such a "Mathematical Abstraction" of problems is called a "Graph ". In this paper, we deal with the notion of star coloring of vertices. A "star coloring" of an undirected graph G is a proper vertex coloring of G such that any path of length 3 is not bi-colored. We give the exact value of the star chromatic number of different of graphs. And also give the exact value of star chromatic number of different families of graphs such as trees, cycles, complete bipartite graph and subdividing graphs also.We find the star chromatic number for the corona graphs of paths with complete graph on the same order $P_n \circ K_n$ ,path with cycle on the same order $P_n \circ C_n$ , path on order n with star graph on order n +1 say $P_n \circ K_{1,n}$, path on order n with bipartite graph on order $n_1 + n_2$ say $P_n \circ K_{n1,n2}$ and corona graph of star graph on order n +1 with complete graph on order n say $K_{1,n} \circ K_n$.

**ICIRIST-IRP-129**

# Possibility Neutrosophic sets and it's properties

**ABSTRACT**

In this paper our aim is to propose the possibility Neutrosophic sets and study their properties. We Characterize a few set theoretic activities of possibility Neutrosophic sets for example union, intersection and complement and discuss their properties. We present some arithmetic and scalar multiplication operator on possibility Neutrosophic sets

**ICIRIST-IRP-130**

# HERMITE POLYNOMIAL

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**ABSTRACT**

"DIFFERENCIAL EQUATIONS" is an important role of mathematics with relevance and lots of applications to almost all the fields. In mathematics, the Hermite polynomials are a classical orthogonal polynomial sequence. The polynomial arises in Signal processing as Hermitian wavelets transform analysis. Probability, such as the Edge worth series, as well as in connection with Brownian motion. Combinatories, as an example of an Appell sequence, obeying the Umbral Calculas. Numerical analysis as Gaussian quadrature. Systems theory in connection with nonlinear operations on Gaussian noise. Random matrix theory in Gaussian ensembles. we shall revisit the solution of Hermite's differential equation and obtain the Hermite polynomials in two different ways: By solving the differential equation and from the generating function. In this paper, we deals with many applications of Hermite polynomials the most conspicuous among these is the orthogonal property of Hermite function.

**ICIRIST-IRP-131**

# MANAGEMENT IN STARTUPS VERSUS MULTINATIONAL COMPANIES

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## ABSTRACT

This study scrutinizes the distinctive management paradigms employed by startups and multinational companies (MNCs), unveiling critical differences that impact organizational strategies and outcomes. In the dynamic ecosystem of startups, a flat and agile organizational structure prevails, fostering rapid decision-making and innovation. Leadership in startups tends to be hands-on and entrepreneurial, driving a culture of creativity and risk-taking. Conversely, MNCs grapple with the complexities of a global footprint, often adopting hierarchical structures and strategic leadership styles to navigate diverse markets and regulatory landscapes. Innovation, a hallmark of startups, is explored in contrast to the established processes and regulations that MNCs must negotiate. The study also investigates divergent approaches to employee engagement and culture, as startups cultivate a close-knit environment while MNCs navigate cultural diversity across dispersed teams. This research aims to contribute valuable insights for practitioners and scholars seeking to optimize management practices in varying organizational contexts, acknowledging the unique challenges and opportunities presented by startups and MNCs in today's rapidly evolving business landscape. This journal aims to explore and compare the distinctive management practices adopted by startups and multinational companies (MNCs). As the business landscape continues to evolve, understanding the differences in management approaches between these two types of organizations becomes crucial for professionals, academics, and aspiring entrepreneurs. The study delves into key areas such as organizational structure, leadership styles, innovation, agility, and employee engagement to provide insights into the contrasting dynamics that shape management in startups and MNCs.

**ICIRIST-IRP-132**

# A REPORT ON THE IMPORTANCE OF WORK-LIFE BALANCE

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## ABSTRACT

In organizations and on the home front, the challenge of work/life balance is rising to the top of many employers "and employees "consciousness. In today "fast-paced society, human resource professionals seek options to positively impact the bottom line of their companies, improve employee morale, retain employees with valuable company knowledge, and keep pace with workplace trends. This article provides human resource professionals with an historical perspective, data and possible solutions for organizations and employees alike to work/life balance. Three factors global competition, personal lives/family values, and an aging workforce present challenges that exacerbate work/life balance.

## Keyword

Work life balance, Current practices, Negatives effect of work life conflict, tips for better work life balance and Ways employers can assist.

**ICIRIST-IRP-133**

# A STUDY ON DIGITAL TRANSFORMATION IN EDUCATION

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## ABSTRACT

In modern conditions, the content of education requires updating and reaching the educational process to a completely new qualitative level.Many educational institutions are actively using digital technologies in their educational process. Based on the study of domestic and foreign literary sources, examples of the use of digital resources in the field of preschool,secondary and higher education are given. The authors of this article focus on the need not only to improve the quality of subject knowledge and master new competencies, but also the special role of working with young people in terms of educating and shaping a young person as a responsible and harmonious personality. The important directions of educational work in theprocess of training and education are determined. The paper presents approaches to the individual design of education and the requirements ofdigital education in general. The qualities that schoolchildren and students
must possess for successful educational activities are listed. The authorshave identified the main advantages and disadvantages of the digitalizationof the educational process in educational institutions. The relevance of the study is dictated by the need to determine the main trends in the development of education in modern conditions. Innovations in the educational process associated with the introduction of digital technologies, at this stage of the development of education, need to be finalized and changed, taking into account the existing experience and strategic goals for the education and upbringing of the younger generation.

**ICIRIST-IRP-134**

# A STUDY ON TALENT MANAGEMENT AND EMPLOYEE ENGAGEMENT

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## ABSTRACT

The purpose of this article is to elaborate what is Talent Management, its importance and how the Strategy influences Employee Engagement and in turn what are the Organizational out comes. It is a conceptual paper based on a review of the academic and popular literatures on Talent Management and Employee Engagement. The study reveals that there is a widely shared belief that human capital is the Organization's primary source of Competitive Advantage; an essential asset that is becoming in increasingly short supply. An effectively implemented Talent Management strategy enhances Employee Engagement which in turn is associated with improved Organizational performance. The term talent was discussed together with some of the approaches to talent management. Whether the approach to talent management is 'inclusive' or 'exclusive,' the terms 'talent management' and 'employee engagement' are inextricably linked such that talent management is integral to engaging employees in the organization. This is further insight, based once again on research and management practice, takes the subject of talent into the area of employee engagement.

**Keywords**

Talent Management, Employee Engagement, Organizational outcome.

**ICIRIST-IRP-135**

# CHALLENGES AND OPPORTUNITIES IN DIGITIAL MARKETING

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**ABSTRACT**

Digital Marketing has become more famous after involvement of latest technologies in businesses. It has completely changed the old marketing methods and forced marketers to stay connected with their buyers or customers via internet for selling their products and services. As a result, the marketers must consider and analysis both advantages and disadvantages of digital marketing while planning the most excellent marketing and setting business goals. why due to high efficiency and effectiveness, Digital Marketing has predictable by all business entity and now it is growing faster with every passing day. Soon, it will become easier for small businesses to try to win their large-scale competitors at the same platform. So digital marketing has become a crucial need of small as well as large scale businesses in today's digital environment.

**Keywords**:
Digital Marketing, Challenges, Opportunities, Effective Communication.

**ICIRIST-IRP-136**

# A Study of Formation and Evolution of Black Hole

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## ABSTRACT

The study of black holes, objects with gravitational fields so intense that even light cannot escape, has a rich history spanning centuries. John Michell and Pierre-Simon Laplace contemplated such entities in the 18th century, setting the stage for subsequent advancements. Karl Schwarzschild's 1916 solution in the framework of general relativity marked a pivotal moment, though it was David Finkelstein in 1958 who first articulated the interpretation of a black hole as a region in space from which nothing can escape.Initially relegated to mathematical curiosity, black holes gained astrophysical significance in the 1960s, thanks to theoretical advancements in general relativity. Jocelyn Bell Burnell's discovery of neutron stars in 1967 intensified interest in the possibility of gravitationally collapsed compact objects, including black holes, as tangible astronomical phenomena.A prominent avenue for black hole formation involves the demise of a massive star. As such a star depletes its internal thermonuclear fuel, a cataclysmic process ensues, leading to the birth of a black hole. This transformation embodies the intricate interplay between gravitational forces and stellar dynamics.The evolutionary journey of a black hole unfolds in stages, influenced by mass, rotation, and accretion of matter. These celestial entities, once deemed enigmatic, are now understood as generic consequences of general relativity. Their exploration has not only deepened our comprehension of fundamental physics but has also provided invaluable insights into the cosmos.

The abstract underscores the historical trajectory of black hole research, highlighting key milestones from early theoretical considerations to contemporary astrophysical observations. The death of massive stars as a precursor to black hole formation serves as a focal point, elucidating the intricate astrophysical processes involved. This study contributes to the ongoing quest for a comprehensive understanding of black holes, bridging theoretical frameworks with observational evidence to unravel the mysteries of these gravitational behemoths in the cosmic landscape.

**Keywords**

Black hole, General Relativity, Chandrashekhartimit, Schwarzschild radius.

**ICIRIST-IRP-137**

# Robotics in Health Care: Who is Liable?

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## ABSTRACT

Ever Since evolution of robotics technology, there has been a prediction that robots will replace the human worker in the near future. In the 21st century, robots are expected to play a vital role in healthcare industry. With the advent of artificial intelligence and its increased recognition and use as an alternate for human being in various sectors, several unaddressed legal concerns have arose. This research paper is an attempt to analyse the laws (that may be applied to robots and/or humans controlling them), legal issue in case of use of robotics in health care industry and its legal repercussions like liability in case of negligence on part robots involve in healthcare. Robotics in healthcare is a rapidly advancing field with profound implications. These technologies, ranging from surgical robots to assistive devices, offer enhanced precision, efficiency, and accessibility in medical practices. Applications include surgery, rehabilitation, diagnostics, and patient care. However, challenges like regulatory frameworks, ethical concerns, and potential job displacement must be addressed. Striking a balance between innovation and safety is crucial to harness the full potential of robotics in improving healthcare outcomes.Liability in Robotics in Healthcare" could explore the evolving landscape of robotics in healthcare and the complex question of responsibility when errors or issues arise. It may delve into legal, ethical, and practical considerations, addressing the challenges in assigning liability and suggesting potential frameworks for accountability. The abstract should provide a concise overview of the key issues and proposed solutions in this intersection of technology and healthcare.

**Key words**

Artificial Intelligence, Robotics,Healthcare, Liability.

**ICIRIST-IRP-138**

# Generalized Flow Performance Analysis of Intrusion Detection using Azure Machine Learning Classification

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## ABSTRACT

The development of real-world databases presents computing difficulties for a single computer. Cloud-based systems, on the other hand, can handle massive quantities of data management activities for large-scale real-world data set calculations. The study focuses on a new Generalized Flow inside the cloud computing platform, Microsoft Azure Machine Learning Studio (MAMLS), which analyses multi-class and binary classification data sets to maximise overall classification accuracy. To begin, each data set is split into training and testing sets. Following that, the training data is utilised to create classification model parameters. Reduce the dimensionality of your data to enhance classification accuracy. Data-centered information increases overall classification accuracy by reducing multi-class classification to a series of hierarchical binary classification problems. Finally, the performance of the improved classification model is tested and appraised. The proposed study assessed algorithm performance utilising 82,332 test samples from a recent data set, UNSW NB-15. It took 6 seconds to train 1,75,341 network instances using the suggested two-class forest decision model. At 99 percent, 94.49 percent, 91.79 percent, and 90.9 percent, the multi-level forest decision- making model recognised attack types such as generics, feats, shellcodes, and worms, respectively.

**ICIRIST-IRP-139**

# The over-ordering problem in trade credit: Role of return policies

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## ABSTRACT

This paper explores the role of return policies on trade credit offered by suppliers to retailers. Traditional trade credit agreements, wherein a supplier extends a short-term loan to a retailer, can lead to over-ordering by the retailer even though she is financially constrained (FC), and this can affect supply chain efficiency. With ever-increasing product-handling costs, such over-ordering can have a severe impact on the supply chain profit. Motivated by our work with an industry partner, we design a game-theoretic model to evaluate optimal stocking decisions and wholesale prices in an FC supply chain, analyse the traditional trade credit model, and establish the reasons for over-ordering by the retailer when trade credit is deployed. We then examine how product returns, prevalent in the industry, can be used to control over-ordering. We design three different mechanisms incorporating returns in a trade credit model: quantity-limit-based returns, partial refund-based returns, and marginal refund-based returns. We find that returns-based policies improve profits for all members of the supply chain by driving inventory reduction and reducing over-ordering when trade credit is used. We also perform numerical analysis to quantify the impact of key parameters on the optimal decision variables. Our paper contributes by suggesting easy-to-implement mechanisms for improving trade credit deployment in supply chains and provides useful insights to decision makers to incorporate returns in trade credit policies.With increasing new product introductions and myriad product choices, many firms are exploring ways and means to reorganize their sourcing and retailing policies to better match supply and demand for their products and services. Several new initiatives have been introduced to address these new challenges such as supply chain financing, postponement, remanufacturing, product returns management, and quick response. In this paper, we explore the boundary between trade credit policies and return policies.

**ICIRIST-IRP-140**

# IMPACT OF NUCLEAR TECHNOLOGY TO THE NATIONAL SOCIO-ECONOMY: TECHNICAL SUPPORT BY NUCLEAR MALAYSIA

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## ABSTRACT

In 1972, Malaysia embarked on a journey into nuclear technology, marking the inception of a development that would span over 30 years. Fast-forward to the present day, and the impact of nuclear technology on Malaysia's socio-economy is evident through its significant contributions to the GDP and the enhancement of overall quality of life.The multifaceted application of nuclear technology has permeated both public and private sectors, leaving its imprint on industries ranging from industrial and medical to agriculture. The year 2008 serves as a pivotal point of reference, showcasing the tangible effects of nuclear technology on the nation's economic landscape. During this period, the technology made a noteworthy contribution, amounting to 0.032% of the total GDP.Analyzing the sectors involved, the industrial domain emerges as the primary beneficiary, displaying a consistent upward trajectory in its reliance on nuclear technology. This sector stands out as the highest contributor to the overall impact of nuclear applications, showcasing the pivotal role played by nuclear technology in industrial development.Conversely, the agricultural sector, while partaking in the utilization of nuclear technology, remains the lowest contributor. This discrepancy underscores the varying degrees of influence nuclear applications exert across different sectors of the economy.Central to the success and responsible application of nuclear technology is the Malaysian Nuclear Agency, commonly known as Nuclear Malaysia. This institution assumes a crucial role as a technical support agency, serving as both a supplier and provider of services, training, and research in the realms of industrial, medical, and agricultural applications. Through its multifaceted contributions, Nuclear Malaysia becomes an indispensable entity, driving advancements in nuclear technology and ensuring its positive impact on Malaysia's socio-economic landscape.In conclusion, the evolution of nuclear technology in Malaysia has unfolded over more than three decades, leaving an indelible mark on the nation's economic fabric.

## Keywords

Kata kunci: impact study, nuclear technology, technical support

**ICIRIST-IRP-141**

# LEADERSHIP CHALLENGES IN REMOTE WORK ENVIRONMENTS

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## ABSTRACT

The pervasive influence of remote work on contemporary professional landscapes has prompted a comprehensive exploration of its ramifications, particularly in the realm of leadership. This abstract encapsulates the essence of a journal report that investigates the intricate challenges confronted by leaders in remote work environments. The report underscores the centrality of effective communication in virtual settings, examining its impact on team dynamics, collaboration, and the potential misinterpretation of messages. Building and maintaining trust, a cornerstone of successful leadership, takes on heightened significance in geographically dispersed teams. In addition to synthesizing existing literature and theoretical frameworks, the report incorporates real-world case studies from diverse industries. The practical recommendations distilled from these insights provide leaders with actionable steps to enhance their effectiveness in the digital era.Looking ahead, the abstract contemplates emerging trends in remote work and their implications for leadership. The fusion of timeless leadership principles with contemporary digital acumen emerges as a recurrent theme, as organizations transition towards hybrid work models and integrate advanced technologies. The report concludes by emphasizing the critical role of adaptive leadership, urging leaders to remain agile, empathetic, and forward-thinking in their pursuit of success in the ever-evolving landscape of remote work. In essence, this journal report aims to serve as a valuable resource for leaders, researchers, and organizations seeking to navigate the complexities of remote leadership successfully. Through its comprehensive examination and practical insights, the report strives to contribute to the ongoing dialogue surrounding effective leadership in the dynamic and transformative world of remote work.

**ICIRIST-IRP-142**

# BUSINESS DIFFERENCES IN DEVELOPING COUNTRIES

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## ABSTRACT

This study investigates the nuanced landscape of business operations in developing countries, emphasizing the distinctive challenges and opportunities that set these economies apart from their developed counterparts. The analysis delves into key aspects such as economic structures, regulatory frameworks, cultural influences, and technological adoption, shedding light on the dynamic interplay of factors that shape the business environment. The research explores the unique economic structures prevalent in developing nations, characterized by a mix of traditional and modern sectors. It examines how informal economies coexist with formal business structures, influencing market dynamics and impacting entrepreneurial endeavours. Regulatory frameworks, often characterized by varying degrees of complexity and enforcement, are scrutinized to understand their impact on business practices, market entry, and sustainability. Cultural influences play a pivotal role in shaping business norms and practices in developing countries. The study investigates the role of cultural nuances in consumer behaviour, negotiation styles, and corporate governance, highlighting their implications for multinational corporations and local enterprises alike. Additionally, the research assesses the impact of social and environmental factors, emphasizing the growing importance of corporate social responsibility in the context of developing economies.

**ICIRIST-IRP-143**

# AN EMPIRICAL STUDY OF HR PLANNING

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## ABSTRACT

Considered being the first and primary practice of human resource management, human resource planning holds a huge role to play. Theoretical bases of HR planning practices have been investigated in detail in this article. Authors have made an attempt to cover and present comprehensive literature on this important practice of HR. The importance of HR planning, its strategic objectives and factors influencing it are all covered in this literature study. Also, the study covers HR planning frameworks and models and tells the processes to retain and motivate the workforce of the organization.

**Keywords**

HR Planning, Practice, Future HR Requirements and Organization

**ICIRIST-IRP-144**

# AN EMPIRICAL STUDY ON DIGITAL MARKETING IN INDIA

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## ABSTRACT

In today's world of digitisation, a digital marketing is having a wide scope across the whole world. Digital marketing in India is rising very fast, with the concept of internet marketing. The trend of digital marketing is growing day by day which is an important platform with electronic gadgets like mobile, smart phones etc.Many companies in India are now using digital marketing as a competitive advantage or as an effective marketing strategy.Digital marketing is referred to different technique of marketing or promotion of products or services or brandsto reach the ultimate customers through digital media, where the customers can access to any information from any place. Today the world has been transitioned into digital environment where the companies can interact with their customers through website, social media, emails and so on, which allows for online customer support by providing 24/7 services to make customers feel valued and supported. Hence, digital marketing is an important marketing strategy which can reach a large customers across the world.

Digital marketing is a new tool which is used in marketing. The purpose of this paper is to analyze the growth and emergence of digital marketing. The objective of the paper is to describes the techniques used in digital marketing. The paper also addresses on the importance and risk factors which are associated with digital marketing in India.

## Keywords

Digital marketing, emergence, techniques, importances and risk factors.

**ICIRIST-IRP-145**

# BLOCKCHAIN TECHNOLOGY BEYOND CRYPTOCURRENCY AND ITS POTENTIAL USES

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**ABSTRACT**

Blockchain (BC), the technology behind the Bitcoin crypto-currency system, is considered to be both alluring and critical for ensuring enhanced security and (in some implementations, non-traceable) privacy for diverse applications in many other domains - including in the Internet of Things (IoT) eco-system. Intensive research is currently being conducted in both academia and industry applying the Blockchain technology in multifarious applications. Proof-of-Work (PoW), a cryptographic puzzle, plays a vital rôle in ensuring BC security by maintaining a digital ledger of transactions, which is considered to be incorruptible. Furthermore, BC uses a changeable Public Key (PK) to record the users' identity, which provides an extra layer of privacy. Not only in cryptocurrency has the successful adoption of BC been implemented but also in multifaceted non-monetary systems such as in: distributed storage systems, proof-of-location, healthcare, decentralized voting and so forth. Recent research articles and projects/applications were surveyed to assess the implementation of BC for enhanced security, to identify associated challenges and to propose solutions for BC enabled enhanced security systems. Keywords: Blockchain (BC); Bitcoin; Crypto-currency; IoT; Proof of Work (PoW); Distributed Digital Ledger

**ICIRIST-IRP-146**

# Data Mining and Predictive Analytics for Injection Molding: An Analysis

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## ABSTRACT

The objective of the researchist of docusate quality product of injection molding for the automobile industry. The root cause of the defects in the product needs to be understood in order to improve the product quality. Method: The research represents an industry Standard Process for Data Mining (CRISP-DM) framework for molding quality improvement. The Logistic Regression, AI ML algorithm has been used to develop the model. Because Logistic Regression is a classification supervised algorithm and our dependent variable also belongs to classification soused this algorithm. Splits the data set for training (66.66%) and testing (33.33%) of the model. Findings: During the literature review, it was found that some of the researchers focused don minimizing the variation in the product quality by considering the filling and packing stage, but only these parameters 'impact on product quality is not sufficient. Considering the limitation as done by many researchers, the presented research work on molding parameters. The presented research considers multiple process-independent variables and their range as mound weight, the temperature of mold and material, injection time, hold time , plasticity time, cooling time ,and total cycle time and one dependent variable like quality .

Novelty : Then novelty of this research is that it is detailing and focus on the quantity of molded items and all independent parameters that impact the dependent parameter (quality) of molded items during the injection molding process. The analysis has been done based on a pattern they find from a machine or database, and it returns the outcome, which can be a prediction.

**Keywords**

Predictive Analytics; Predictive Injection Molding; Data Mining; Machine Learning; Descriptive Data Mining; Predictive Data Minin

**ICIRIST-IRP-147**

# MUTUAL FUND TREND ANALYSIS IN INDIAN CAPITAL MARKET

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## ABSTRACT

Mutual fund industry has experienced a drastic growth within the past twenty years. Increase within the number of schemes with increased mobilization of funds in the past few years provide benefits to the importance of the Indian mutual funds industry. Mutual funds have a number of schemes within it, such as large cap, Mid cap and Small cap funds, which makes it hard for the investors to choose the best scheme out of so many available options. This Study specifically focused on the performance analysis of mutual fund schemes based on the Large cap, Mid cap and Small cap, which helps investors to take decision based on risk and returns in current time. These mutual funds individually using different tools such as Annual returns, Standard Deviation, Beta, Sharpe's Ratio, Treynor's Ratio, Jensen's Alpha Ratio.

**ICIRIST-IRP-148**

# DIGITAL TRANSFORMATION IN SUPPLY CHAIN MANAGEMENT: ENHANCING EFFICIENCY AND RESILIENCE

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## ABSTRACT

The landscape of supply chain management is undergoing a revolutionary shift driven by digital transformation. This abstract explores the multifaceted dimensions of this transformation, with a specific focus on how it enhances efficiency and resilience within the supply chain. As industries adapt to the demands of the digital era, leveraging advanced technologies such as artificial intelligence, the Internet of Things (Iot), block chain, and data analytics becomes imperative for optimizing operations.The integration of these technologies fosters efficiency by streamlining processes, automating routine tasks, and providing real-time visibility into the entire supply chain. Artificial intelligence, for instance, enables predictive analytics, allowing organizations to forecast demand, optimize inventory levels, and enhance overall decision-making. The lot facilitates the creation of smart, interconnected supply chain networks, enabling stakeholders to monitor and control various elements of the supply chain remotely. Moreover, block chain technology ensures transparency, traceability, and security in transactions, thereby reducing the risk of fraud and errors. In addition to efficiency gains, digital transformation significantly contributes to building resilience in supply chains. The ability to quickly adapt to disruptions, whether caused by natural disasters, geopolitical events, or unexpected market shifts, is a critical aspect of modern supply chain management. Advanced technologies enable real-time risk monitoring and mitigation strategies, empowering organizations to proactively respond to disruptions and make informed decisions to safeguard the continuity of their operations. The use of data analytics in risk management enhances the supply chain's ability to identify vulnerabilities and establish contingency plans.

**ICIRIST-IRP-149**

# GROWTH AND DEVELOPMENT OF MUTUAL FUND IN INDIA

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## ABSTRACT

Mutual funds have become one of the most attractive ways for the average person to invest their surplus money. A mutual fund pools resources from thousands of investors and then diversifies its investment into many different holdings such as stocks, bonds, or government securities in order to provide high relative safety and returns. Investment industry in India has gone through huge pace of reinventions, given changes in monetary and political policies of government. Most of the funds also offer retirement plan choices traditional. Things to investigate before invest in a mutual fund are how long the fund has been in existence, average annual rate of return, the tenure of the fund managers, investment objectives, type of companies the fund invested in, and costs the fund charges. This will help to the investors in many ways like, selection process to determine long and short term investment needs. The performance of the mutual fund industry can be examined in terms of: the nature of the growth of the industry itself, long-term impact of the growth on the economy in general and the financial market in particular, and the benefits to investors in terms of returns on their investments.

**ICIRIST-IRP-150**

# IMPACTS ON MERGER AND ACQUISITIONS IN CORPORATE SECTOR IN INDIA

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## ABSTRACT

In today's corporate world Merger and Acquisition is spreading all over the industries which have totally restructured the whole market place. Mergers and Acquisitions are normal way of life within the business world. The success of mergers, acquisitions or takeovers is determined by a number of factors but also harm the creditability of the company. They are a big part of corporate finance world. On an average last 4 years company's earning in India have been increasing by 20-25% because of company's effective strategy of M&A's. In my perspective of reasons for engage in merger and acquisition, how the employees, shareholders, competition and the management people are affected has been briefed. Mergers and acquisitions are aimed at improving profits and productivity of a company. Simultaneously, the objective is also to reduce expenses of the firm. Mergers and acquisitions (M&A's) often refer to the aspect of corporate strategy, and management dealing with the buying, selling and combining of another company. Mergers and acquisitions are often created to expand a current organization or operation aiming for long term profitability and an increase in market power. If a merger is to reach its full success potential, they need to be informed and involved more actively throughout all the stages of the merger process. Studies have suggested that mergers and acquisitions affect the senior executives, labor force and the shareholders.

**ICIRIST-IRP-151**

# A STUDY ON INVESTOR BEHAVIOR TOWARDS DERIVATIVE MARKETS IN INDIAN CONTEXT

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## Abstract

The behavior of retail investor's is changing towards derivative market in India for the last few years and with the introduction of behavioral finance the researcher would like to capture that. The concept of behavioral finance is booming in the capital market, there is hardly any place where its concepts aren't being applied. There is a need to grab more attention of the investor's towards derivative market and draw inferences from investor's behavior so that the derivative market can benefit and understand investor's preference better and unravel the factors that influence the risk tolerance level of the investors. So the study will give the researcher a quantitative model reflecting the factors affecting the investor behavior in derivative market with load factors. Through this study the researchers would like to study the various factors responsible for the investment behavior in derivative market. This will not only help the asset management companies to frame there investment policy but also help the macro policy makers to frame certain policy which will encourage investors to invest in derivated market. The regulatory authorities should improve on their performance in order to increase the confidence of the local investor. Furthermore they should introduce investor incentives to boost the volumes traded on the exchange with a review of the derivative market regulations with a view to make them stronger and more attractive to local investors. The present scenario of investment in share market is highly unpredictable. in this situation the systematic and careful study before investment is very necessary.

## Keywords

Talent Management, Employee Engagement, Organizational outcome.

ICIRIST-IRP-152

# Roles in financial strategy

**Abstract**

This study scrutinizes the distinctions and intersections between portfolio management and wealth management, shedding light on their respective roles in financial strategy. Through a comprehensive examination of risk tolerance, investment objectives, and client engagement models, the research seeks to elucidate the nuanced approaches employed in each discipline. By comparing and contrasting portfolio management's focus on optimizing investment portfolios with wealth management's holistic approach encompassing financial planning, estate management, and intergenerational wealth transfer, this paper aims to offer insights into the strategic considerations that investors and financial professionals should weigh when choosing between these two pivotal components of financial management.

**ICIRIST-IRP-153**

# TRAINING AND DEVELOPMENT IN A POST COVID-19 WORKPLACE

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**Abstract**

Intelligent businesses have been raising harsh questions regarding conventional approaches to schooling and the growth of their workers since long before our current crisis. The fantasy of "all-online digital learning" at the beginning of the 21st century has largely failed, particularly because some of the most critical management skills are better taught and trained in person. "The soft thing," it points out, is really the hard thing, and managers who are involved in improving behavioral abilities and emotional maturity, and the capacity to interact and control others would not significantly advance with an online module. That being said, the completely unpredictable path of transition in 2020 causes us all to reconsider how we can improve and prepare our staff and construct and expand our organizational and cultural capability while we actually cannot get together in person. Leadership development takes on added significance in nurturing resilience and effective communication amidst uncertainty. E-learning platforms facilitate flexible, self-paced learning, accommodating diverse schedules and preferences. Tailoring training content to address mental health and well-being also plays a crucial role in supporting employees during challenging times. In this transformed workplace, adaptability is a key competency. Training modules focusing on problem-solving, creativity, and change management empower employees to thrive in dynamic environments. Regular assessments and feedback loops ensure the relevance and efficacy of training initiatives.

ICIRIST-IRP-154

# Trends in research on project-based science and technology teaching and learning at K–12 levels: a systematic review

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**Abstract**

Project-based teaching is nothing new; it originates from the work of authors like Dewey and Kilpatrick. Recent decades have seen renewed interest in this approach. In many countries, it is currently considered to be an innovative approach to science and technology (S&T) teaching. In this article, we present a systematic review of what recent scientific publications teach us about this approach: How is this approach identified in these publications? How is the use of this approach in school S&T justified? What are the main research questions covered by studies in the field? What do these studies on this approach teach us? To answer these questions, we have selected and analysed articles published, between 2000 and 2014, in journals that are specialised in school science and technology education and that are indexed in ERIC database. In the synthesis based on this analysis, we present: (a) the theoretical constructs used by the authors to refer to this approach and the features identified to define it; (b) the justifications for this approach; (c) the research questions covered by studies in the field; (d) the data collection and analysis methods used in these studies; and (e) the main findings. In addition to presenting a synthesis of current research in this field, we offer a critical discussion thereof with a focus on two aspects, namely the way PBSTL is conceptualised and the rigour of the research methods used to ensure the validity of findings.

**Keywords**

Project-based teaching; project-based learning; science education; technology education; systematic review

ICIRIST-IRP-155

# LABOUR WELFARE MEASURES INFLUENCE ON LABOUR EFFECTIVENESS

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## Abstract

During the growing time of technology, the organizations cannot increase their employee's commitment by providing salaries on time. When the organization offer different welfare measures to their employees, there is an opportunity to increase the commitment of the employee. Objective: The aim of the study is to analyze labor welfare measure and its relationship with employee's commitment. Materials and Methods: A sample of 76 respondents (84.2% male and 15.8% female) from Jyothi Laboratories Limited were participated in the study and the census method was adopted in the collection of data from individual respondents. Result: The findings of the research indicated that the labor welfare measure especially health insurance, housing facility, hygienic toilet facility, transport facility, rest and lunch room facility, compensation on death and recreational facilities creates a positive approach on employee's commitment, The factors of labor welfare measures namely statutory welfare measure and non-statutory welfare measure are highly influenced by the employee's commitment like affective and normative commitment. But in the case of continuance commitment, social security measure alone creates an impact, the remaining variable are not creating any impact on continuance commitment. The study concluded that the organization has to take a necessary action against the labor welfare measure which creates a negative approach among the employees, it will definitely raise the employee's commitment and also increase the organization's revenue in future

## Keywords

Labor Welfare Measure, Statutory Welfare Measure, Non-statutory Welfare Measure, Social Security Measure, Job Commitment, Employee's Commitment, Involvement, Engagement

ICIRIST-IRP-156

# AI REVALUATION IN BUSINESS AND MANUFACTURING IN MODERN SCENARIO

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## Abstract

Artificial Intelligence (AI) is fundamentally transforming the landscape of business and production, ushering in an era of unprecedented efficiency and innovation. In the realm of business, AI is a powerful ally in data analysis, enabling companies to extract valuable insights from vast datasets, facilitating informed decision-making. Additionally, AI-driven customer engagement, often facilitated through chatbots, enhances interaction and responsiveness, leading to improved customer satisfaction.In the production sector, AI plays a pivotal role in revolutionizing traditional manufacturing processes. Automation, powered by AI, is optimizing workflows, reducing manual labor, and enhancing overall productivity. Predictive maintenance, another AI application, minimizes downtime by forecasting potential equipment failures, allowing proactive interventions. The integration of AI technologies translates into tangible benefits such as cost savings, streamlined operations, and enhanced competitiveness. As businesses leverage AI to navigate the complexities of the modern landscape, and production processes evolve with intelligent automation, the synergy between AI and industry continues to reshape traditional paradigms, fostering a more agile and responsive ecosystem.

## Keyword

AI, business transformation, production optimization, data analysis, decision-making, automation, inventory management, cost savings.

**ICIRIST-IRP-157**

# GLOBAL FINANCE TERNDS

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**Abstract**

This paper provides an overview of the status, evolution, innovations, technology infrastructure, administrative and support systems, resources, growth, impacts, effectiveness, risks, and challenges of e-Finance. The research method used includes a critical review of archival literature --scholarly and journalistic – organizing and presenting them in a systematic way. All areas of e-finance and applications of the Internet technologies to financial services industry are covered It discusses how organizations could benefit from such innovations and e-finance systems and infrastructure and technology. Furthermore, the paper discusses the impacts of e- finance models, infrastructure, challenges and risks that the financial services industry faces. It identifies areas of further research in e-finance technology, regulation, and the interface of financial services industry–legacy and new -- with the dynamic Information Technology Industry (ITI) -- consisting of manufacturers and suppliers of computers, telecommunications, business equipment, software, and IT services, the Internet industry -- the Internet and wireless industries.

**Keywords**

Green Marketing; environmental; Ecological; Corporate social responsibility

**ICIRIST-IRP-158**

# STUDY ON BRAND IDENTITY & BRAND PREFERENCE AMONG THE RURAL A CUSTOMER

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## Abstract

Identification of brand is one of the crucial tasks in the market. Because many number of product and service as well as various brand easily available in the market. Based on quality , lifetime & various aspects the customer choose the brand product and service .branded product/service is not easily available in all rural market because the transport facility in rural area is typically poor. Many rural uneducated customer known about the product brand name with the aid of advertisement (television) rural people have less brand awareness in compared to urban people. In this journal explained for which factor most influence the buying behavior of customer and how the rural customer choose FMCG product with their low brand awareness.

**ICIRIST-IRP-159**

# A STUDY ON WORK-LIFE BALANCE IN WORKINGWOMEN –TIRUCHIRAPPALI

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**Abstract**

This article review aspects of contemporary theory and research an work life balance. Work life balance is refer to the level of prioritization between personal and professional activity in an individual life and level to which activity related to their job are present in the home. The role of working women has changed throughout the world due to economic condition and social demands .The achieving work life balance is a necessity for working women to have a good quality of life the various factor affecting the work life balance of married working women have been examined in this study. Moreover technology has complete the removed the separation between the occupational and the personal and people are expected to be available for work at all times. This has resulted in a scenario in which working women have tremendous pressure to develop a career as robust as their male counterparts while sustaining active engagement in personal life. The increasing responsibilities on the personal front with the technological blessings like advanced mobile phones, notepads, etc., This paper is an attempt to explore the tough challenges faced by working women in maintaining a balance between their personal and professional life.

**ICIRIST-IRP-160**

# ORGANIZATIONAL CULTURE AND ORGANIZATIONAL PERFORMANCE

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## Abstract

A few studies have dealt with work attitudes and work behavior as intervening variables with regards to the relationship between organizational culture and organizational performance. Therefore, the purpose of this research is to develop and test a theoretical framework that combines organizational culture in relationship to work related attitudes, work behavior as intervening variables and organizational performance as a dependent variable. The Structural Equation Modeling results show that both work-related attitudes and work behavior can be seen as related to organizational performance. Meanwhile the structural equation model apparently eliminates the relationship between organizational culture and performance.

## Keywords

Organizational culture; Work-related attitudes; Work behavior; Organizational performance

**ICIRIST-IRP-161**

# Design and modelling of Active Quasi Z-Source Multilevel Inverter With High Gain Boost

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## Abstract

This paper proposes a three-level diode clamped active impedance source inverter (AIS-TLI) based on the quasi Z-source inverter (qZSI). Apart from having minimal components and the inherent benefits of three-level qZSIs, such as single-stage buck-boost capability, shoot-through (ST) immunity, and continuity of input current, the proposed topology has a higher boost capability and excellent efficiency .In addition, the inverter bridge has a higher modulation index, which improves the quality of the output waveform and necessitates less inductance. The proposed topology provides common ground between input and output terminals, which effectively eliminates leakage current in PV-powered single-phase systems .This paper describes the different operating modes principle, dynamic analysis, steady-state analysis, and parameter selection instructions for the proposed in-depth. Furthermore, the suggested inverter's benefits and limitations are compared to the traditional (q)ZSIs and some other AIS-TLIs. Finally, modeling and experimental results are used to confirm the effectiveness of the suggested topology.

**ICIRIST-IRP-162**

# A STUDY ON DIGITAL MARKETING IN BUSINESS GROWTH

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## Abstract

The world is shifting from analog to digital and marketing is no exception. As technology development is increasing, the use of digital marketing, social media marketing, search engine marketing is also increasing. Internet users are increasing rapidly and digital marketing has profited the most because it mainly depends on the internet. This paper begins with an introduction of digital marketing and then it highlights the mediums of digital marketing, the difference between traditional and digital marketing, and the pros, cons, and importance of digital marketing in today's era. Digital marketing is the marketing of products or services using digital technologies, mainly on the Internet, but also including mobile phones, display advertising, and any other digital medium. Digital marketing's development since the 1990s and 2000s has changed the way brands and businesses use technology for marketing. As digital platforms are increasingly incorporated into marketing plans and everyday life, and as people use digital devices instead of visiting physical shops, digital marketing campaigns are becoming more prevalent and efficient. This paper mainly focuses on conceptual understanding of digital marketing, how digital marketing helps today's business and some cases in the form of examples.

**ICIRIST-IRP-163**

# AN EMPIRICAL STUDY ON DIGITAL MARKETING IN INDIA

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## Abstract

In today's world of digitisation, a digital marketing is having a wide scope across the whole world. Digital marketing in India is rising very fast, with the concept of internet marketing. The trend of digital marketing is growing day by day which is an important platform with electronic gadgets like mobile, smart phones etc.Many companies in India are now using digital marketing as a competitive advantage or as an effective marketing strategy. Digital marketing is referred to different technique of marketing or promotion of products or services or brandsto reach the ultimate customers through digital media, where the customers can access to any information from any place. Today the world has been transitioned into digital environment where the companies can interact with their customers through website, social media, emails and so on, which allows for online customer support by providing 24/7 services to make customers feel valued and supported. Hence, digital marketing is an important marketing strategy which can reach a large customers across the world. Digital marketing is a new tool which is used in marketing. The purpose of this paper is to analyze the growth and emergence of digital marketing. The objective of the paper is to describes the techniques used in digital marketing. The paper also addresses on the importance and risk factors which are associated with digital marketing in India.

## Keywords

Digital marketing, emergence, techniques, importances and risk factors.

ICIRIST-IRP-164

# USE OF AI IN HUMAN RESOURCE MANAGEMENT


## Abstract

Artificial intelligence (AI) is transforming businesses across industries, including human resources (HR) functions. This paper analyses' current and potential applications of AI in key HR responsibility areas – recruiting, on boarding, training, performance management, and retention. It evaluates benefits such as improved efficiency, unbiased decisions, personalized experiences, and data-driven insights. However, risks around job automation, ethical biases, lack of emotional intelligence, and employee privacy are assessed. Though AI adoption in HR is still in early phases, the technology promises to reshape departments placing greater focus on strategic priorities. Recommendations centre on thoughtful integration of AI aligned to organizational goals and supplemented by human oversight.

**ICIRIST-IRP-165**

# CUSTOMERS SATISFACTION TOWARDS ONLINE SHOPPING - A STUDY

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## Abstract

Online shopping is the biggest part of customer attraction as well as customer satisfaction. In today's technology environment, most businesses rely on internet purchasing to both please their consumers and attract new ones. The effects of online shopping on improving customer satisfaction are the subject of this study report. The study also sought to determine the effects of online shopping on improving customer satisfaction in retail establishments. The research tasks entailed an ethical construction of a questionnaire keeping in view the research topic and tasks at hand. The construction of the survey was done keeping multiple touch points in consideration. Extensive research was done to identify the most prominent issues in the realm of online shopping. The survey was constructed based on these observations and was then circulated to a group of 100 respondents of varying ages, genders, and from different physical locations. Likert scales were used to gather experience-based data from all respondents. After being working on the research, we have come to learn that customer satisfaction plays a vital role in how the choices of people to shop online. Websites offering online shopping must have good customer services and user-friendly applications or websites to be easily accessible to the public and therefore making them prefer online shopping over in-person shopping. The study also revealed that online shopping has a variety of consequences (age and gender) and according to the analysis, online shopping assists in good quality, access, and comfort, resulting in increased customer satisfaction.

ICIRIST-IRP-166

# THE GLOBAL FINANCE TRENDS AND MARKETING COMMUNICATION

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## Abstract

International finance is that branch of financial economics that deals with the monetary or the macroeconomic interrelations between two or more nation. Such as balance of payments, stock exchanges, exchange rates, foreign direct investment as well as international tradeIt studies various components of finance, such as a balance of payments (all financial and trade transactions between a nation's residents and the rest of the world), the foreign exchange market, financial markets, and international monetary polic

## Keywords

Recession, Debt, Cash outflow, External capital, Investment.

**ICIRIST-IRP-167**

# Investigation of Mechanical, Wear and Micro structural studies of Boron nitride and Egg shell reinforced Hybrid Metal Matrix Composites

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**Abstract**

The superior quality offered by Aluminum Metal Matrix Composites (AMMC) over the years has made it a widely used material for the production of various components in the engineering segment. Aluminium alloy LM4 was selected as a matrix material and Boron nitride and ball milling processed egg shell is taken as the two reinforcements. The reinforcements which will be added in the AMMC will make significant contributions for improving the desired material properties. An exploratory study was conducted in this investigation on the development of aluminum-based (LM 4) hybrid metal matrix composites with reinforcements of Boron nitride and egg shell. The composite is fabricated using the stir casting approach with various reinforcement combinations by different weight proportions (LM 4+ Graphite + fly-ash) After the fabrication all the composites mechanical properties like hardness, tensile strength, impact and compression strength properties and also wear properties are measure to find best performance composites for suitable applications. Microstructural images will taken for the confirmation uniform distribution of reinforcement particles.

**Keywords**

Aluminium Metal Matrix Composites, Aluminium alloy LM4 Boron nitride, Egg shell,Stircasting

**ICIRIST-IRP-168**

# Experimental study on the influence of copper oxide nano additives on the performance and emission characteristics by using putranjiva biodiesel

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## Abstract

The Putranjiva biodiesel blend's impact combined with copper oxide nanoparticles on a single-cylinder diesel engine's performance and emission characteristics was considered in the present research. At dosing levels of 25 ppm, 50 ppm, 75 ppm, and 100 ppm, respectively, copper oxide nanoparticles were chosen as fuel additives, and a biodiesel blend is prepared by mixing 80 percent diesel and 20 percent biodiesel Putranjiva. The research study noted that the presence of a highly reactive surface prompted chemical reactivity, resulting in improved combustion. The biodiesel blend's distributed nanoparticles' brake thermal efficiency and specific fuel consumption improved. Incomplete combustion products such as carbon monoxide, unburnt hydrocarbon, and smoke density have also substantially decreased.

## Keywords

Putranjiva biodiesel, Performance, Emission, Copper oxide.

**ICIRIST-IRP-169**

# Optimization of A-TIG Welding Process to Joint Mild Steel to 316L Stainless Steel By Using Particle Swarm Method

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**Abstract**

A 316L stainless steel joined to mild steel is widespread in several applications to reach a requested good association of mechanical properties at a lower cost. The activating tungsten inert gas (ATIG) weld was carried out using a modified flux composed of 76.63% SiO2 + 13.37% Cr2O3 + 10% Fe2O3 to meet standard recommendations in terms of limiting the root penetration. Modified optimal flux gave a depth of penetration 1.84 times greater than that of conventional tungsten inert gas (TIG) welds and a root penetration of up to 0.8 mm. The microstructure of the dissimilar joints was investigated using a scanning electron microscope and EDS analysis. The mechanical properties of the weld were not affected by the modified flux. The results show that the energy absorbed in the fusion zone in the case of ATIG weld (239 J/cm2) is greater than that of TIG weld (216 J/cm2). It was found that the weld bead obtained with the optimal flux combination in ATIG welding can better withstand sudden loads. The obtained UTS value (377 MPa) for ATIG welding was close to that of TIG welding (376 MPa). The average Vickers hardness readings for ATIG welds in the fusion zone are up to 277 HV, compared to 252 HV for conventional TIG welding.

**ICIRIST-IRP-170**

# PERFORMANCE ANALYSIS OF ALTERNATIVE FUELS WITH VARIOUS ENGINE PARAMETERS

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**Abstract**

The use of biodiesel has become increasingly popular due to its lower greenhouse gas emissions and renewable nature, but there are some operational challenges with the use of biodiesel. Biodiesel has lower energy content compared to fossil diesel, leading to reduced engine power and fuel economy, and its tendency to degrade over time and in cold temperatures can cause engine performance issues. The experiment consists of varying injection timings and pressures to determine their impact on engine performance. Specifically, three different injection pressures of 18 Mpa, 20 Mpa, and 22 Mpawere tested, as well as three different injection timings of 19o CA bTDC, 24o CA bTDC, and 28o CA bTDC. TBC engine shows a reduction of approximately 3% in specific fuel consumption (SFC) and a 28% reduction in unburned hydrocarbons (UHC) emissions. Additionally, the brake thermal efficiency (BTE) and indicated mean effective pressure (IMEP) show increases of 4% and 13%, respectively. Furthermore, late injection of B100 in the TBC engine results in a 35% reduction in hydrocarbon emissions. Using the response surface methodology optimization, it was determined that the optimal operating conditions for the TBC engine fueled with microalgae biofuel were an injection pressure of 18 MPa, an injection timing of 19o CA BTDC, a load value of 71%, and a blend ratio of 36%. These conditions were found to be optimal for achieving the best performance and emission characteristics.

**ICIRIST-IRP-171**

# EXPLORING THE MECHANICAL PROPERTIES OF EPOXY-BASED HYBRID COMPOSITES REINFORCED WITH NATURAL FIBERS: AN EXPERIMENTAL STUDY

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**Abstract**

In the current research landscape, the exploration of natural fiber composites stands out as a paramount area of investigation, given their ready availability, versatile applications, and environmentally friendly attributes. This study delves into an examination of bamboo, banana, and hemp composite samples, specifically scrutinizing their thermal conductivity, water absorption behavior, tensile strength, flexural strength, and impact strength. The pivotal property of thermal conductivity, measured according to ASTM standards, revealed that composite sample C displayed a lower thermal conductivity (2.42 W/m-K) compared to samples A and B, recording values of 2.71 W/m-K and 3.29 W/m-K, respectively. Furthermore, sample C showcased exceptional water absorption resistance, absorbing only 11.67% water after 24 hours of immersion, surpassing the water absorption rates of sample A (20.25%) and sample B (16.98%). In tensile tests, the augmentation of palm fiber content from 5% to 15% yielded a commendable 12% increase in tensile strength, with sample C outperforming both samples A and B. The improvement continued into flexural strength, with a significant 55% enhancement observed with a shift from 5% to 15% bamboo weight percentage and a reduction in banana fiber content. Sample C exhibited a remarkable 36.24% and 20% higher flexural strength compared to samples A and B, respectively. Impact tests underscored that a higher palm fiber content correlated with a substantial 57% increase in impact strength, and sample C stood out with a notable 36.59% improvement over sample A. This comprehensive study underscores the promising attributes of natural fiber composites, with sample C demonstrating superior performance across various critical properties.

**Keywords**

Bamboo, Banana, Hemp, Palm Fiber

**ICIRIST-IRP-172**

# INVESTIGATION INTO THE MECHANICAL CHARACTERISTICS OF POLYMER COMPOSITES REINFORCED WITH CARBON FIBER

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## Abstract

The study aims to analyze the tensile and flexural properties of carbon fiber-reinforced chemical compounds (CFRP), including graphene and styrene-butadiene-styrene (SBS). Experimental methods are employed in various laboratories to test the carbon fiber-reinforced polymer (CFRP) with graphene and styrene-butadiene-styrene (SBS). Specimens were cut according to ASTM standards, and a universal testing machine (UTM) was utilized to investigate the tensile and flexural properties of carbon fiber-reinforced polymer (CFRP). The study found that SBS enhances the stiffness of CFRP, while graphene contributes to achieving higher strength. Among various types, SBS-containing samples exhibited the highest flexural and storage modulus. Graphene-incorporated samples demonstrated the most significant improvement in tensile and flexural strength, displaying maximum strength and power dissipation capability in tensile tests. In contrast, the addition of SBS reduced stiffness and significantly increased the strain to failure of the composites. The study's findings highlight the dependence on the fiber orientation of carbon fiber-reinforced polymer.

## Keywords

carbon fibre reinforced polymer, tensile properties, flexural properties

**ICIRIST-IRP-173**

# Experimental investigation of performance and emission characteristics of jojoba biodiesel with La2O3 metal oxide

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**Abstract**

Biodiesel mixtures are tested with different proportions of fuel additives (Lanthanum oxide) like B20, B20+50 ppm, and B20+100ppm to see how they perform and how they behave with fuel additives. We synthesized and characterized these nanoparticles using a Scanning Electron Microscope and Energy Dispersive X-ray. The nano-additives were stirred for 30 minutes with B20, then ultrasound for 10 minutes. The use of such mixtures is influenced by improved combustion properties of biodiesel blends, which result in a lot more NOx released in the exhaust. In general, all unhealthy exhaust pollutants, including Hydrocarbons and Carbon Monoxide, decrease marginally, except for nitrogen oxides in biodiesel blended with fuel additives. Compared to B20, the distributed biodiesel mixture with nanoparticles had a higher brake thermal efficiency. The amount of incomplete combustion products has gone down, like carbon monoxide and unburned hydrocarbons.

**Keywords**

Biodiesel, Performance, Emission, Lanthanum oxide.

**ICIRIST-IRP-174**

# Tribological behaviour of RuO2 in diesel: Benthic-diatom Navicula sp. algae biodiesel

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**Abstract**

An operating automotive engine generates more friction as well as wears in between their sliding parts when compared to an idle one, and so needs lubrication to lower this particular frictional impact. Biodiesel is surely an alternative renewable source of diesel fuel. The current research will measure the friction and wear characteristics of benthic-diatom Navicula sp. algae biodiesel with RuO2 at various concentrations. The biodiesel was studied at various blends such as B20, B20+50 ppm, and B20+100 ppm. Tests had been carried out at a speed of 1200 rpm at 75 °C under an average load of 40 kg per 1 h. Results revealed that friction and wear decreased with an increase in the concentration of RuO2 nanoparticles in biodiesel.

**Keywords**

Algae biodiesel, Four-ball tests, Friction, Ruthenium oxide, SEM/EDX analysis, Wear

**ICIRIST-IRP-175**

# INVESTIGATIONS ON TRIBOLOGYCHARACTERISTICS OF SESAMUM INDICUM (GINGELLY) BIODIESEL

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## Abstract

When an automobile engine is running it producesmore friction and wear between the sliding components such as cylinder, pistons, piston rings, fuel injectors and pumps and lubrication is required for reducing the frictional effect. Friction and wear reduce engine life, reliability and increase the maintenance cost. This study investigated and compared the friction and wear characteristics of diesel, Sesamum Indicum biodiesel, and their blends, by using the four-ball tester. Sesamum Indicum biodiesel was produced by using trans - Esterification process and the investigated fuels were 30%(SIB30), 70% (SIB70) of biodiesel blended with pure diesel. Experiment was conducted during 3600 s with constant temperature at 75 ◦ C. And constant sliding speed of 1200 rpm at load of 40 kg for all tested fuels. The worn surfaces of the ball were examined by SEM analysis. SIB70 exhibits a lower worn scar surface area than diesel. SIB70 have good lubricity in the fuel to reduce the friction and wear in the sliding components in the engine. And the possibility to form highly lubricating film without breaking down over a long time.Botanical name of the gingelly: - Sesamum Indicum

## Keywords

Sesamum Indicum, Renewable energy, fourball test, Friction and Wear, Biodiesel, SIB 70 and SIB30, Tribology.

**ICIRIST-IRP-176**

# EXPERIMENTAL ANALYSIS OF DELAMINATION FAILURE IN HEMP-COIR FIBER REINFORCED POLYMER COMPOSITES

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## Abstract

In recent years, natural fibers are viable to substitute for the synthetic fiber and which come as the abundant. In this paper, a partial ecological composite was made using Hemp-Coir fibers as reinforcement in the epoxy resin. Both treated and untreated fibers were utilized composite manufacturing at different fiber loading content (25% and 30%). Water absorption test was conducted by the composite specimen and also to investigate the effect of fiber treatment on mechanical properties and their machining characteristics were studied. This paper mainly emphasizes on hybrid compositesof delamination failure during drilling process. It was reduced by varying its speed level and feed rate as a input parameter and their response is delamination failure. The response was analyzed using Taguchi methodand ANOVA analysis to examine the relation between the input parameter and output response and also to know the most influencing factors on the response.

**Keywords**

Hemp and coir fiber, surface treatment, epoxy resin based composite, Delamination failure, Taguchi method.

**ICIRIST-IRP-177**

# OPTIMISATION OF MACHINING PARAMETERS IN ALUMINIUM ALLOY COMPOSITE USING GENETIC ALGORITHM

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## Abstract

Aluminium alloy composites have emerged as an important class of materials, which are increasingly being utilized in recent years. Application of these materials in certain areas is limited due to difficulties in machining. The principal machining parameters that control machinability characteristics are extrinsic parameters (cutting speed, feed rate, depth of cut, and type of cutting tools) and intrinsic parameters (particulate size, volume fraction, and type of reinforcement) Using genetic algorithms for the optimal search of cutting conditions, the chromosomes represent cutting conditions defined according to a temporal scale and are composed by random keys. The present review is focused on the influence of cutting parameters of reinforcement on the surface finish. This review will provide an insight into selecting the optimum machining parameters for machining metal matrix composites.

## Keywords

Machining; Aluminium alloy composites; Optimisation; Genetic algorithm

**ICIRIST-IRP-178**

# Experimental investigation of performance and emission characteristics by using jatropha biodiesel with ruthenium oxide

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## Abstract

Biofuels derived from bio seeds have been demonstrated to be better alternatives to fossil fuel-based fuels in agriculture and transportation than biofuels derived from fossil fuels. Biofuels have developed a reputation as an alternative fuel in India due to energy requirements, agricultural growth, environmental degradation, and rural development. Nanoparticles are dispersed in the current diesel engine, so if the additives are properly applied to the biodiesel, the engine will perform better. Because combustion additives release energy into the fuel, nano additives also enhance thermal efficiency. To determine the effect of Ruthenium oxide nano additives on Jatropha biodiesel efficiency and emissions, this study utilized a single-cylinder four-stroke diesel engine. The optimized B20 + Ruthenium oxide fuel blend was found to have greater performance and reduced CO and HC emissions as compared to B20. In addition, at peak load, a small amount of NOx emissions has been increased compared to B20.

## Keywords

Jatropha, Performance, Emission, Ruthenium.

**ICIRIST-IRP-179**

# Development of Mathematical Model to estimate the Solar Photovoltaic Module Temperature Based on Energy Balance

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**Abstract**

In this study mathematical model was developed to predict the solar photovoltaic module temperature based on energy balance over solar panel. Meteorological parameters like wind speed at panel location, solar radiation on the panel and ambient temperature were taken into account .Panel type , panel mounting and orientation was also considered for this study.Validation was done with the hourly-averaged measured data of the above mentioned meteorological parameters and panel temperature at one location and instantaneous values at another location .Error in panel temperature was found to be 3.71% and 4.3% respectively for two locations. Estimating the panel temperature is important in predicting the power output of the panel.

**Keywords**

Photo voltaic module; Metrological parameters; Panel orientation; Panel Temperature

**ICIRIST-IRP-180**

# Study of tribological properties of Navicula Sp. algae biodiesel incorporating La2O3 nanoparticles

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**ABSTRACT**

The present study examines the tribological characteristics of biodiesel by using a four-ball tribometer. This research focuses on the friction and wear characteristics of Navicula sp. algae biodiesel with La2O3 at varying concentrations. Biodiesel has been evaluated for blended fuels such as B20, B20 + La2O3 (50 ppm), and B20 + La2O3 (100 ppm). The test was conducted at a constant speed of 1200 rpm and 75 C at an average load of 40 kg per 1 h. The experimental results indicate that La2O3 added nanoparticles to Naviculla Sp. algae methyl ester show significant friction reduction. It was found that B20 + La2O3 (100 ppm) decreased the wear scar diameter up to 36.9% Compared to B20. The wear rates of the balls were tested by scanning electron microscope.

**ICIRIST-IRP-181**

# Advancing Healthcare with Smart Drug Delivery Systems: Enhancing Precision and Patient Care"

**ABSTRACT**

The objective of this project is to investigate and explore the field of smart drug delivery systems, which utilize advanced technologies to improve the precision, efficacy, and convenience of medication administration. These systems can respond to specific patient needs and conditions, leading to more personalized and effective healthcare.

**ICIRIST-IRP-182**

# SIMULATION OF MUNICIPAL WASTE WATER TREATMENT PLANT FOR SLUDGE REMOVAL

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## ABSTRACT

Municipal wastewater treatment plants play a pivotal role in safeguarding public and environmental health by treating wastewater before its discharge. Among the critical processes within these facilities, sludge removal is of paramount importance to ensure operational efficiency and environmental compliance. This study presents a comprehensive simulation model designed to optimize sludge removal in a municipal wastewater treatment plant.Municipal waste water contains organic waste which is harmful to human and environment. Hence the both bottleneck process showed relatively high efficiency in removing nitrogen and TDS from waste water, it was confirmed that the customized design plant is suitable for the removal of sludge.Through iterative simulations, the model identifies optimal operating conditions, equipment configurations, and process adjustments to enhance sludge removal efficiency while minimizing energy consumption and operational costs. The model captures the intricate interactions within the treatment system, offering a realistic depiction of sludge settling, thickening, and removal. By providing a virtual environment for testing and refining sludge removal strategies, the model contributes to the sustainable and cost-effective operation of municipal wastewater treatment plants, ensuring the responsible management of sludge while meeting stringent environmental standards.

**Keywords**

Superpro, Granular media filter, Nitrogen, TDS

**ICIRIST-IRP-183**

# FORMULATION AND EVALUATION OF POLYHERBAL FACIAL SCRUB

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## ABSTRACT

Cosmetics are used to both improve and maintain clean, healthy skin. Although there is a large variety of a cosmetic on the market, herbal cosmetics are said to have fewer or no negative effects than chemical cosmetics. It has antibacterial, antimicrobial, and anti-aging qualities. Using a face scrub helps to prevent wrinkles and acne while removing dead skin cells and enhancing the texture of the skin. This is the first study to use pomegranate peel as the active ingredient in facial scrub. Other components utilized for specialized qualities include soapnut, white turmeric, ragi, neem, turmeric, and aloe vera. Two formulations (FS1 and FS2) were made, and a number of characteristics were assessed, including spreadability, washability, grittiness, pH, consistency, color, and irritation. Only formulation 2 (FS2) caused irritation as a side effect following skin application, although both formulations 1 (FS1) and 2 (FS2) showed positive outcomes. Formulation 1 has no negative effects. This suggests that rather than FS2, FS1 would be a more effective face scrub. It is necessary to do additional in vitro and in vivo research in order to develop FS1 for use as a facial scrub.

**Keywords**

Pomegranate peel, poly herbal cosmetics, facial scrub

**ICIRIST-IRP-184**

# EVALUATION OF ANTI-DIABETIC PROPERTY OF CISSUS QUADRANGULARIS THROUGH INHIBITION OF POTENTIAL TARGETS-AN INSILICO & INVITRO APPROACH

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## ABSTRACT

In the current scenario, Diabetes mellitus is a chronic disease by which more than 62 million people are suffering from. There are two types of diabetes that are caused either by deficiency of insulin or malfunction of the same. Starch or glycogen present in the dietary supplements is hydrolysed into glucose moieties by enzymes such as Alpha amylase and alpha glucosidases. Accumulation of the glucose moieties in blood causes diabetes. Hence diabetes can be controlled by inhibiting the action of these enzymes. Alpha glucosidase hydrolyses terminal, non-reducing (1->4)-linked Alpha-D-glucose residues and releases Alpha-D-glucose, leading to diabetes. Cissusquadrangularis, is a climber that has a lot of medicinal values, one among which is anti-diabetic property. The compound responsible for the anti-diabetic property through inhibition of alpha glucosidase is to be identified and isolated. Isolation of the specific compound helps to control type II diabetes. In-Silico analysis of the phytochemicals present in the plant has been done using PASS prediction, a bioinformatics tool. Plant extracts were prepared using Soxhlet extraction and maceration extraction. The extracts were subjected to various phytochemical assays to confirm the presence of the phytochemicals such as flavonoids, alkaloids, proteins, carbohydrates, glycosides, phenols and tannins. The extract is also checked for its inhibitory action against the enzyme. Further, the extract is to be analyzed through HPTLC (High Performance Thin Layer Chromatography), FTIR (Fourier transform infrared spectroscopy) and LC-MS analysis (Liquid Chromatography coupled with Mass Spectrometry). Thus, the presence of the inhibitor and its inhibition percentage against the enzyme alpha glucosidase is to be evaluated.

## Keywords

Diabetes mellitus, Cissus Quadrangularis, Bioinformatics tools, Alpha Glucosidase.

**ICIRIST-IRP-185**

# Nuclear-Targeting RGD-Functionalized cerium oxide nanoparticles for Extremely Low NIR Activated Photothermal Therapy

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## ABSTRACT

The modern research on photothermal therapy (PTT), an emerging technology that uses light-converting agents to burn malignant cells with optical energy-converted heat, indicates the specific relevance of photo-related nanomedicine as an emerging paradigm toward precise cancer therapy. The intranuclear photothermal therapy (PTT) of cancer is the primary focus of the current study. It is made possible by the nuclear-targeted distribution of cerium oxide nanoparticles functionalized with arginine-glycine-aspartate (RGD) and nucleus location signal peptides CeO2NPs@RGD@NLS, which are exposed to very low near-infrared radiation. When exposed to near-infrared laser radiation, they showed extremely selective targeting and deleterious effects on both solid tumors and cancer cells. A noteworthy finding is that the nuclear-focused temperature increase produced by CeO2NPs@RGD@NLS is sufficient to damage intranuclear DNA and block the DNA repair process, leading to cancer cell apoptosis instead of the more common thermal ablation necrosis during PTT. Thus, the CeO2NPs@RGD@NLS shows significant promise for use in selective photothermal treatment, imaging, and nuclear targeting.

## Keywords

Photothermal, RGD peptide, nanomedicine, near-infrared,nuclear targeting, cerium oxidenanoparticles

**ICIRIST-IRP-186**

# Comprehensive Exploration of Pluchea lanceolata (DC.) Oliv. & Hiern: Phytochemical, Pharmacological, and Therapeutic Potential

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## ABSTRACT

Pluchea lanceolata (DC.) Oliv. & Hiern, a rapidly spreading perennial herb from the Asteraceae family, has shown promise in managing anti-inflammatory diseases. This review assesses its phytochemical and pharmacological aspects, emphasizing traditional uses. Triterpenoids, sterols, flavonoids, and lactones, identified as prominent constituents, modulate therapeutic targets, particularly in inflammation and arthritis. Among approximately 80 Pluchea species, only 16 have traditional uses across Asia, the Middle East, and North America, with P. lanceolata prominent in the Indian system of medicine and ethnopharmacology. Investigation into the biochemical and physiological mechanisms involved in its diverse biological properties, especially inflammation and arthritis, is warranted. Despite extensive traditional use, challenges persist, including the absence of plant-specific chemical markers for quality assurance and bioactivity-specific compounds for efficacy. Information on secondary metabolites, their modes of action, physiological pathways, bioavailability, and pharmacokinetics is lacking. In-vitro studies highlight therapeutic potential, but limited clinical data and the absence of a well-established margin of safety in long-term use necessitate further research. Proper identification remains a concern, with pharmacognostical characterizations reported but lacking chromatographic fingerprint methods and molecular markers like Random Amplified Polymorphic DNA (RAPD). Preliminary in-vivo studies are promising, but a systematic and integrated scientific approach is crucial for comprehensive exploration of P. lanceolata as a potential lead for arthritis therapeutics.

## Keywords

Pluchea lanceolata Triterpenoids, Inflammation, Arthritis

**ICIRIST-IRP-187**

# DEVELOPMENT OF CHITIN BASED BIOMIMETIC SCAFFOLDS FOR TISSUE REGENERATION FROM MARINE WASTE

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## ABSTRACT

This study presents a novel and sustainable approach for the development of biomimetic scaffolds utilizing chitin extracted from marine waste, specifically crustacean shells. Chitin, a natural polymer abundant in marine byproducts, serves as a valuable resource for creating biomaterials with applications in tissue engineering and drug delivery. The research encompasses the extraction and purification of chitin, its subsequent modification, and the design and fabrication of biomimetic scaffolds. Various fabrication techniques, including freeze-drying, electrospinning, and 3D printing, are employed to achieve scaffold structures with optimal porosity and mechanical properties. The scaffolds are further characterized using techniques such as scanning electron microscopy (SEM) and Fourier-transform infrared spectroscopy (FTIR). Biological evaluations, both in vitro and potentially in vivo, assess the biocompatibility and bioactivity of the developed scaffolds, considering parameters such as cell adhesion, proliferation, and differentiation. The study aims to not only repurpose marine waste but also contribute to the advancement of sustainable biomaterials, addressing environmental concerns associated with waste disposal. As a result, this research may pave the way for the commercialization of chitin-based biomimetic scaffolds, offering promising solutions for regenerative medicine and therapeutic applications.

**Keywords**

Chitin, Composites, Scaffolds, Tissue regeneration

ICIRIST-IRP-188

# Extraction of bioactive compounds from Ziziphus mauritiana for Blood Purification: A Comprehensive Review

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## ABSTRACT

Ziziphus mauritiana, commonly known as Indian jujube or ber, has long been recognized for its medicinal properties in traditional medicine systems. This review explores the extraction of medicinal compounds from Ziziphus mauritiana and its potential application in the blood purification process. Ziziphus mauritiana is rich in bioactive compounds such as flavonoids, triterpenoids, alkaloids, and polysaccharides. These compounds exhibit various pharmacological properties, including anti-inflammatory, antioxidant, and immunomodulatory effects. Additionally, some components demonstrate the potential to regulate blood parameters, making them intriguing candidates for blood purification processes. Several studies have suggested that Ziziphus mauritiana extracts possess properties that can aid in the removal of toxins and impurities from the blood. The antioxidant activity of flavonoids and triterpenoids may contribute to neutralizing free radicals and reducing oxidative stress, thus promoting blood detoxification. Furthermore, the immunomodulatory effects of certain compounds could enhance the immune system's ability to eliminate harmful substances from the bloodstream. The review also addresses challenges associated with the utilization of Ziziphus mauritiana extracts for blood purification. Factors such as standardization of extraction processes, dosage optimization, and potential side effects need careful consideration. The integration of traditional knowledge with modern scientific methodologies is crucial for harnessing the full therapeutic potential of Ziziphus mauritiana. Additionally, exploring synergistic effects of Ziziphus mauritiana extracts with existing medical treatments may open new avenues for integrative medicine approaches.

## Keywords

Be fruit, bioactive compounds, blood detoxification

ICIRIST-IRP-189

# FIBROUS SCAFFOLDS FROM BANANA FIBERS FOR ADVANCED WOUND HEALING PATCHES: A SUSTAINABLE APPROACH

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## ABSTRACT

Wound healing remains a critical aspect of healthcare, and the development of innovative materials for effective wound management is of paramount importance. This study explores the utilization of banana fibers, a sustainable and abundant natural resource, for the fabrication of fibrous scaffolds intended for wound healing patches. The eco-friendly nature of banana fibers makes them an attractive alternative to synthetic materials, contributing to the growing field of sustainable biomaterials. The banana's fibrous structure mimics the extracellular matrix, providing a conducive environment for cell adhesion, proliferation, and tissue regeneration. Biocompatibility studies conducted using in vitro and in vivo models demonstrate the non-toxic nature of the banana fiber scaffolds, fostering a favorable environment for cell viability and tissue integration. Additionally, the inherent antimicrobial properties of banana fibers contribute to infection control, a critical aspect of wound care. The environmental impact assessment of banana fiber-based scaffolds emphasizes the sustainability and biodegradability of the materials, aligning with the global shift towards green and eco-friendly solutions. The cost-effectiveness and ease of scalability further support the feasibility of incorporating banana fibers into commercial wound healing patches. An eco-friendly alternative, banana fiber-based wound healing patches may contribute significantly to the advancement of regenerative medicine and address the increasing demand for sustainable healthcare solutions.

## Keywords

Banana fibers, scaffolds, tissue regeneration, wound healing

**ICIRIST-IRP-190**

# Comprehensive Review of Pharmacological Studies on Flavonoids Derived From Marine Algae: Potential Health Benefits and Therapeutic Applications

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## ABSTRACT

Marine algae, as a rich and diverse source of bioactive compounds, have gained increasing attention in the field of pharmacology. Among these compounds, flavonoids from marine algae have emerged as promising candidates for various health benefits and therapeutic applications. This comprehensive review aims to provide a detailed overview of the pharmacological studies conducted on flavonoids derived from marine algae. The pharmacological activities of marine algae-derived flavonoids are systematically presented, covering a wide range of health-promoting effects. These include antioxidant, anti-inflammatory, anticancer, antiviral, antidiabetic, and neuroprotective activities, among others. The mechanisms underlying these pharmacological actions are elucidated, providing insights into the molecular pathways and cellular targets involved. Furthermore, the review explores the potential therapeutic applications of marine algae-derived flavonoids in various diseases and conditions. Special attention is given to their role in cardiovascular health, metabolic disorders, neurodegenerative diseases, and immune modulation. The safety profile and potential side effects of these compounds are also addressed, ensuring a balanced evaluation of their suitability for clinical use. The gaps in current research are identified, suggesting directions for future investigations to fully harness the therapeutic benefits of these marine-derived compounds. Overall, the findings presented in this review contribute to a deeper understanding of the pharmacological relevance of marine algae-derived flavonoids, paving the way for the development of novel and effective therapeutic interventions.

**Keywords**

Marine algae, Flavonoids, Metabolic disorders

**ICIRIST-IRP-191**

# Development and Evaluations Ceftriaxone Sodium Loaded Nano-Structured Lipid Carriers against Bacterial Meningitis

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## ABSTRACT

The use of nanocarriers to enhance drug delivery efficacy has been increasing in the healthcare field due to their tunable surface properties. In this study, ceftriaxone-loaded solid lipid nanoparticles were synthesized using a water-in-oil-in-water (w/o/w) type double emulsification method. The solid lipid glycerly monostreate contain ceftriaxone nanoparticles showed higher entrapment efficiency. The ceftriaxone-loaded solid lipid nanoparticles were of spherical shape, 382.7 nm in size with positive surface charge, and retained the properties of the drug or other constituents/ingredients after loading. The prepared nanoformulation offered sustained drug release after 12 h, while ceftriaxone sodium followed a burst release. Antibacterial activity of the nanoformulation was evaluated against different gram-positive and gram-negative bacterial strains. The minimum inhibitory concentration of ceftriaxone-loaded solid lipid nanoparticles against staphylococous aureus was determined as 2 µg/mL.

## Keywords

Ceftriaxone sodium, Solid lipid nanoparticles, Antibacterial activity, Nanoformulation

**ICIRIST-IRP-192**

# eMARINE WASTE DERIVED 3D BIOMIMETIC SCAFFOLDS FOR TISSUE ENGINEERING


## ABSTRACT

The field of tissue engineering seeks innovative solutions to address tissue and organ shortages, aiming to revolutionize regenerative medicine. Simultaneously marine waste pollution poses a significant environmental challenge worldwide, with detrimental consequences for aquatic ecosystems and human health. This research focuses on the development, characterization, and functional evaluation of marine waste-derived 3D biomimetic scaffolds. The successful utilization of marine waste-derived 3D scaffolds not only addresses the pressing issue of marine waste pollution but also offers an eco-friendly, sustainable solution for tissue engineering. Notably, Sepia officinalis and Oreochromis niloticus, two different classes of fishes that offer unique biological and structural resources that hold promise for a range of tissue engineering applications. Sepia officinalis, a cephalopod mollusk, contributes its calcium carbonate-rich cuttlebone, known for its intricate porous structure. This naturally occurring biomaterial, abundant in marine environments, presents an opportunity to create 3D scaffolds with exceptional biocompatibility and mechanical properties. Tilapia skin-derived collagen has demonstrated remarkable biocompatibility, making it suitable for applications in skin regeneration, wound healing, and the engineering of cartilage and ligament tissues. By leveraging materials science, biomaterials engineering, and tissue engineering principles, these scaffolds aim to provide an environment conducive to cell adhesion, proliferation, and differentiation, closely mirroring the native tissue microenvironment. The potential applications of these scaffolds span various tissue types, including bone, cartilage, and skin regeneration, offering a versatile platform for tissue engineering strategies. Furthermore, this research opens doors to interdisciplinary collaborations and innovative approaches that can contribute to the advancement of both environmental conservation and regenerative medicine, offering hope for a cleaner, healthier, and more sustainable future.

**ICIRIST-IRP-193**

# Development and characterization of levofloxacin-loaded niosomes for bacterial infections

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## ABSTRACT

The delivery of drugs by "vesicular drug delivery system" such as nano-niosomes provides several important advantages over conventional drug therapy. This study reports the development of a highly stable niosomal nanostructure based on Span 60, span 80/cholesterol, chitosan system and its potential application for oral delivery of Levofloxacin. Levofloxacin loaded niosomes were prepared by reversed-phase evaporation and Chitosan coating was performed by incubation of niosomal suspensions with Chitosan solution. The prepared niosomes were characterized for entrapment efficiency (EE), in vitro drug release, drug release kinetics, particle size, zeta potential, surface morphology, anti microbial activity and stability study. Highest entrapment efficiency was observed in LNF-3 79.11. The formulation LNF-3 released 99.03% of drug for the prolonged period of time (12 hours) than other formulations. The study of drug release kinetics showed that formulations governed by higuchi kinetic model (R2=9792). Particle size and zeta potential of the LNF3 formulation was found to be 339.40 nm with unimodal distribution (PDI 0.160), +23.1mV with spherical morphology. The in-vitro antimicrobial efficiency of optimized noisome formulation enhanced 2-fold by compared with Levofloxacin alone, revealed that niosomes formulations have stronger inhibitory activity. The optimized noisome formulation showed excellent stability in for over 90 days at 40°C.

## Keywords

Levofloxacin, Niosomes, reversed-phase evaporation, in-vitro study, stability study

ICIRIST-IRP-194

# EVALUATION OF ANTIDIABETIC POTENTIAL OF SYZYGIUM CUMINI (JAMUN) SEED EXTRACT USING IN VITRO AND IN SILICO ANALYSIS USING NETWORK PHARMACOLOGY APPROACH

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## ABSTRACT

Diabetes mellitus is a debilitating metabolic disorder with increased prevalence throughout the world, which is associated with insulin resistance (IR), impaired insulin signaling, beta cell dysfunction, abnormal glucose levels and altered lipid metabolism. The medicines available for treating type II diabetes are costly and show increased side effects, therefore plant based phytomedicines are preferred. Syzygium cumini (Jamun) is one of the well-known folklore medicines which is used in treating diabetes. Invivo and cellular studies provide evidence that flavonoids from S.cumini seeds have beneficial action to fight diabetic complications. In the present study, network pharmacology, a new and recently developing approach towards drug discovery, is used to evaluate the anti Diabetic activity of the phytoconstituents present in the fruit and seed of Syzygium cumini. Different networks were created and further evaluation was done by docking the identified target with the selected ligands using PyRx docking tool. Network analysis revealed the association of bio actives present in the seed of Syzygium cumini with potential drug targets for the management of type 2 diabetes. Results reveal that the phytoconstituents present in seed of Syzygium cumini can be used for effective management of type II diabetes .In addition to that the mechanism of action of anti-diabetic property of S. potential of S. cumini seeds were checked and validated through several different assays namely Glucose Dialysis Retardation Index(GDRI) ,Yeast cell assay, Hemoglobin glycation assay. The results obtained by these assays showed that the seed extract exhibited 93% of glucose uptake by yeast cells which is greater than the control in yeast cell assay, glucose retardation index of above 90% in the glucose retardation index (GDRI), and inhibition of Glycation of haemoglobin in the range of 9-10% in Glycohaemoglobin assay which is found to be a good control for type II diabetes. The anti-oxidant properties were evaluated by using Total antioxidant assay, FRAP assay and DPPH assay to support its usage as a potential phytomedicine to treat Diabetes mellitus.

**Keywords**

Diabetes mellitus, Network Pharmacology, Phytomedicines, Anti- diabetic assays, Antioxidant assays

**ICIRIST-IRP-195**

# REVIEW OF OPUNTIA FICUS INDICA (CACTUS) FIBERS IN THE DEVELOPMENT OF TRANSDERMAL PATCHES

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## ABSTRACT

This comprehensive review investigates the innovative use of Opuntia ficus-indica (cactus) fibers in the development of transdermal patches. The botanical richness and adaptability of Opuntia ficus-indica have sparked interest in harnessing its fibers for sustainable and effective transdermal drug delivery systems. This analysis emphasizes the unique attributes that make cactus fibers compelling candidates for integration into transdermal patches. Environmental considerations are explored, focusing on the biodegradability of cactus fibers and their potential to contribute to environmentally friendly pharmaceutical formulations. The mechanical strength and flexibility endowed by cactus fibers are discussed, underlining their significance in ensuring the durability and wearability of transdermal patches. Furthermore, the review explores the skin-friendly properties of cactus fibers, including their soothing and anti-inflammatory effects, which could be particularly beneficial for individuals with sensitive skin. Compatibility with active ingredients commonly used in transdermal patches is analyzed, providing insights into potential synergies and formulation challenges. This review offers a concise yet comprehensive overview of the current state of research, signaling the potential of Opuntia ficus-indica fibers to redefine the landscape of transdermal patch technology.

**KeyWords**

Opuntia ficus-indica, Transdermal patch, Fibers

**ICIRIST-IRP-196**

# Protective effects of Phyllanthus acidus (L.) Skeels leaf extracts on acetaminophen induced hepatic injuries in rat model

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## ABSTRACT

To investigate the hepatoprotective activity of aqueous extracts of Phyllanthus acidus (L.) Skeels (AEPA) leaves against paracetamol induced liver damage into Sprague-Dawley rats.The Hepatoprotective activity aimed at plant extract was investigated for paracetamol-induced hepatoxicity into rats. Sprague-Dawley rats of either sex were divided into 7 groups of 5 animals each and were given orally the following treatment for 3 days. The normal control was given 1% sodium CMC 1ml/kg bw,p.o. Paracetamol at a dose of 3g/kg bw,p.o. was given as toxic dose for inducing hepatotoxicity.Liv.52 (50mg/animal,p.o) was given as a reference standard. Two different doses of AEPA (200mg/kg,p.o,and 100mg/kg,p.o) was tested for Hepatoprotective activity. The treatment was given for 3 days and after 48 hrs of last treatment blood was collected from direct cardiac puncture and analysed for various serum parameters in different groups.The Phytochemical investigation of the both extracts showed the presence of alkaloids, flavonoids, glycosides, carbohydrates, saponin and tannin and phenols. The Paracetamol intoxication lead to histological and biochemical deterioration. The treatment with AEPA reduced the level of SGOT, SGPT, TB,DB and TC and also reversed the hepatic damage towards normal which further supports the Hepatoprotective activity of leaf AEPA .

## Keywords

Hepatoprotective, LIV.52, Phyllanthus acidus, Paracetamol and Sprague-Dawley

ICIRIST-IRP-197

# Exploring Protease Inhibitors and Antioxidant Properties in Xanthium strumarium L. Seeds

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## ABSTRACT

In humans, various diseases are associated with the accumulation of free radicals. Plants, known for their rich reservoir of proteases and protease inhibitors, play a crucial role in scavenging free radicals and mitigating their adverse effects. This study focused on screening effective inhibitors for serine proteases and evaluating the free radical scavenging activity in seeds of the plant Xanthium strumarium L. The investigation revealed that the crude extract from Xanthium strumarium L. seeds exhibited a modest 33.54% protease inhibition. However, the ammonium sulfate fractionation of Xanthium strumarium L. seeds, leading to partial purification, demonstrated a remarkable 74.61% protease inhibitor activity. Additionally, this fraction displayed significant antioxidant activity comparable to standard antioxidants. These findings suggest the potential of Xanthium strumarium L. seeds in the development of functional foods and nutraceuticals. Moreover, this study lays the foundation for further research aimed at discovering new secondary metabolites with bioactive compound potential.

## Keywords

Xanthium strumarium L. Protease inhibitors, Antioxidant activity

**ICIRIST-IRP-198**

# Development and Evaluation of Push Pull Osmotic Pump Tablets of Sitagliptin phosphate

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## ABSTRACT

Push pull osmotic pump (PPOP) drug delivery system is a dosage form, which provides controlled release of drug for long duration and makes it one of the most promising drug delivery systems in the recent times. The present study was aimed to develop a POPP for Sitagliptin phosphate to achieve zero order release that would reduce the frequency of dosing and thus improves the patient compliance. The effect of degree of semi permeable coating essentially consisting of Opadry CA and mannitol as pore forming agent also evaluated. In all, 12 batches of Sitagliptin phosphate PPOP subjected to various pre and post compression evaluation. The dissolution data was fitted to various mathematical models to describe kinetics of drug release. All the pre and post compression parameters of formulated PPOP tablets results within the limits. The FTIR results optimized formulation suggested that good chemical stability of drug and polymer. The optimized formulation (F-10) contain locust bean gum (50 mg) successfully retarded drug release for 12 h and the drug release followed zero order kinetic with (R2 = 0.974) and korsermayer peppas equation showed the (R2=0.891) with anomalous (non fickian diffusion). The accelerated stability profiles indicate that the physicochemical properties of the tablets are not affected on storage at 40 ± 2ºC & 75 ± 5% RH up to 3 months.

**Keywords**

Push Pull Osmotic Pump, Controlled release, Sitagliptin phosphate, Opadry CA, zero order

**ICIRIST-IRP-199**

# Enhanced antiviral activity of acyclovir-loaded chitosan nanoparticles

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## ABSTRACT

The delivery of drug by oral drug delivery system such as nano particles provides several important advantages over conventional drug therapy. This study reports the development of high stable nano particles, nano structure based on chitosan, tri polyphosphate system and its potential application for oral delivery of acyclovir. Acyclovir loaded nano particles were prepared by ionic gelation method. The prepared nano particles were characterized for entrapment efficiency (EE), in vitro drug release, drug release kinetic, particle size, zeta potential, and surface morphology study. The optimized ANF-3 showed entrapment efficiency 67.11% and entire drug release drug for prolonged period of time (12 hours) than other formation. The drug release governed by zero order kinetics model (R2=9870). Particle size and zeta potential of ANF-3 formulation was found to be 192.5 nm with unimodel distribution (PDI 0.520), surface charge -33.91 mV with spherical morphology.

## Keywords

Acyclovir, Nanoparticles, Ionic gelation method, In vitro studies

**ICIRIST-IRP-200**

# Screening of analgesic and anti-inflammatory activities of Phyllanthus acidus in suitable models

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## ABSTRACT

Phyllanthus acidus, renowned for its medicinal properties, has a history of use in various countries. In traditional Indian medicine, Phyllanthus acidus has been employed to address conditions such as diabetes and gastrointestinal disorders. In certain rural regions of India, it has even been consumed in its raw form as a vegetable. This research delved into the analgesic and anti-inflammatory attributes of the ether fraction of Phyllanthus acidus (PAEE). Phytochemical screening and assessment of free radical scavenging activities were conducted, with compound identification performed through LC-MS analysis. Analgesic activities were explored through writhing and hot plate methods in mice, encompassing both peripheral and central effects. In-vitro anti-inflammatory activity was assessed in RAW 264.7 macrophages. Carrageenan-induced paw inflammation and cotton pellet granuloma studies were carried out in vivo. Phytochemical analysis revealed the presence of alkaloids, terpenoids, saponins, phenols, and flavonoids. The compound BFCA demonstrated notable DPPH assay activity, with IC50 values of 55.5 ± 4.07 µg/mL. Additionally, in β-carotene bleaching, H2O2 scavenging activities exhibited IC50 values of 47.5 ± 4.07 and 49.24 ± 0.52 µg/mL, respectively. Importantly, PAEE displayed no signs of toxicity or mortality at doses up to 2000 mg/kg in mice. PAEE proven effective dose-dependent analgesic activity, with the 200 mg/kg dose showing superior results. Furthermore, PAEE exhibited substantial inhibition against RAW 264.7 macrophages. Similarly, at a dose of 100 mg/kg, PAEE demonstrated significant anti-inflammatory effects in both in-vivo models. These findings collectively support the potential of Phyllanthus acidus as a valuable analgesic and anti-inflammatory agent.

**Keywords**
Phyllanthus acidus, inflammation, toxicity, carrageenan, macrophages.

**ICIRIST-IRP-201**

# Formulation and evaluation of Colon Targeted Trimetazidine Hydrochloride Microspheres

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## ABSTRACT

The aim of the present study is to develop colon targeted drug delivery systems for Trimetazidine Hcl using Chitosan and Pectin as a carrier. In this study, investigation of an oral colon specific, pulsatile device to achieve time or site specific release of Trimetazidine, based on chronopharmaceutical considerations. The basic design consists of an insoluble hard gelatin capsule body, filled with chitosan and pectin microsphere of trimetazidine and sealed with a hydrogel plug. The trimetazidine microsphere were prepared, evaluated for the FTIR study, surface morphology, particle size, drug content, Invitro Studies and from the obtained results one better formulation was selected for further fabrication of pulsatile capsule. FTIR study confirmed that there was no interaction between drug and polymer, the shape of microsphere was found to be spherical by SEM studies.

## Keywords

Chronopharmaceutics, Angina pectoris, Trimetazidine Hydrochloride, Chitosan, Pectin

**ICIRIST-IRP-202**

# COTTON NANOFIBER-BASED DRUG DELIVERY MODULES: REVOLUTIONIZING DRUG DISTRIBUTION

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## ABSTRACT

In recent years, the field of drug delivery has undergone a transformative shift, with nanotechnology emerging as a pivotal player in enhancing therapeutic outcomes. Among the myriad of nanomaterials explored for drug delivery applications, cotton nanofibers have emerged as a promising candidate, offering a unique set of properties that make them well-suited for efficient drug distribution. This abstract provides a concise overview of the key aspects surrounding cotton nanofiber-based drug delivery modules, encompassing their fabrication methods, distinctive properties, and applications in drug distribution. Fabrication methods play a crucial role in determining the effectiveness of drug delivery systems employed in producing cotton nanofibers. The fabrication method involves electrospinning, self-assembly, and template-assisted methods emphasizing the influence on the morphology and properties of cotton nanofibers. The physical, chemical, and mechanical properties of cotton nanofibers constitute a critical aspect of their applicability in drug delivery systems. Delving into drug loading and release mechanisms, the abstract elucidates the strategies employed for efficient drug incorporation onto cotton nanofibers and the controlled release profiles achieved. The review contributes the need for further research to address existing challenges and propel these innovative systems toward practical applications, ultimately contributing to the advancement of personalized and effective drug therapies.

**Keywords**

Cotton, Nano fiber, Drug delivery

**ICIRIST-IRP-203**

# VIBRATIONAL RESONANCE IN A INTEGRATIVE TIME - DELAYED DYNAMICAL SYSTEM

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## ABSTRACT

In this paper, We have discussed the dynamical systems, linear and nonlinear forces are clearly explained we discussed the dynamics of the time-delayed linear and nonlinear systems. Especially, how the time-delay is affect the physical, chemical and biological dynamical systems. We have studied the vibrational resonance phenomena in a integrative time-delayed feedback. When the delay feedback is absent, the system can exhibits the resonance and we have presented some of the FORTRAN program for various dynamical systems. The Second Order Non- linear Integrative Time-delay Forced Equation is numerically solved by the Euler Method. The error has been reported in the form of h2.

**Keyword**

Nonlinear system, time delay, dynamical system ,vibrational resonance.

**ICIRIST-IRP-204**

# CRYSTAL GROWTH IN VIEW OF DEVICE FABRICATION

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**ABSTRACT**

The main aim of the present investigation is divided into three sections. The first priority is the synthesis and growth of efficient nonlinear optical single crystals with low cost. Mostly all organic nonlinear optical materials are moderate cost with good chemical stability. In the second part, after growth, the grown single crystals have been subjected to preliminary characterization studies such as chemical composition, crystalline, optical behavior and mechanical strength. The final part is the checking of the crystalline nature by powder XRD. N (2chlorophenyl-1-propanamide) is grown by slow evaporation solution growth technique. The lattice parameters have been determined from the powder X-ray diffraction pattern and confirmed that the crystal belongs to monoclinic crystal system. The functional groups of the compound have been determined from the Fourier transform infrared spectra. From the Raman Spectra analysis it is observed that the intensity is more in powder sample compared to crystal form. It is due to the molecular packing of the system. The thermal analysis has been carried out for the same. Optical assessment reveals that the absorbance is less than one unit between 400 and 1200 nm. This illustrates the absence of any overtones or combination modes above 250 nm and absorbance due to electronic transition between 400 and 750 nm. This less absorbance in the entire visible and near IR region is an important requirement to a material for NLO applications.

**ICIRIST-IRP-205**

# IOT BASED BATTERY HEALTH MONITORING SYSTEM FOR ELECTRICAL VEHICLE

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## ABSTRACT

A system incorporates temperature control mechanisms that maintain the battery within optimal temperature ranges. In instances of overheating or extreme temperature conditions, the system activates automatic cooling or heating in the evolving landscape of modern transportation, the rise of electric vehicles (EVs) underscores the critical importance of efficiently managing their battery systems. This abstract introduces an IOT-based solution engineered to vigilantly monitor EV battery health, ensuring peak performance, unwavering safety, and extended longevity. The proposed system seamlessly integrates real-time battery monitoring, temperature regulation, automatic cut-off mechanisms, and emergency communication capabilities. At its core, this system deploys a network of sensors and controllers within the EV's battery system, collecting real-time data on battery voltage, current, temperature, and other vital parameters. This data is transmitted wirelessly to a central processing unit, which conducts comprehensive analysis and health assessments of the battery. Beyond its foundational components, the system boasts a groundbreaking feature: predictive maintenance. In these moments, the system autonomously initiates an emergency distress message to a predefined list of contacts, including emergency services and the vehicle owner. This rapid communication mechanism not only enhances passenger safety but also expedites timely assistance in distressful scenarios. In conclusion, the IoT-based battery health monitoring system for electric vehicles presents a holistic solution to confront the challenges tied to battery performance and safety. By harnessing real-time data analysis, temperature control, automatic cut-off safeguards, predictive maintenance, V2G functionality, and emergency communication capabilities, this system significantly contributes to the efficient operation, durability, financial advantages, and security of electric vehicles within the contemporary and dynamic transportation landscape.

## Keywords

Electric vehicle battery monitoring , Arduino, temperature sensor , Iot based system, Cooling system, sos system

**ICIRIST-IRP-206**

# IOT DOGDAYCARE ROBOT WITH REMOTE SURVEILLANCE AND AUTO FEEDING

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## ABSTRACT

This project outlines the design and development of an Iot-based dog daycare robot equipped with remote surveillance and automatic feeding capabilities.the system is designed to experience of pet owners by allowing them to remotely monitor and interact with their pets while they are away.The robot utilizes a combination of hardware components and software solutions to provide real-time video streaming, two-way audio communication, and automated feeding.The primary objective is to ensure the well- being of dogs in daycare environments and facilitate owner-pet communication.This abstract provides an overview of the key features and functionalities of the Iot dog daycare robot,highlighting its potential benefits for pet owners and the pet care industry.

**Keywords**

security,interactive play,pet health,remote monitoring.

**ICIRIST-IRP-207**

# SELF BALANCING ROBOT

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## ABSTRACT

Two wheeled balancing robots are an area of research that may well provide the future locomotion for everyday robots. The unique stability control that is required to keep the robot upright differentiates it from traditional forms of robotics. The inverted pendulum principle provides the mathematical modelling of the naturally unstable system. This is then utilized to develop and implement a suitable stability control system that is responsive, timely and successful in achieving this objective. Completing the design and development phase of the robot requires careful consideration of all aspects including operating conditions, materials, hardware, sensors and software. This process provides the ongoing opportunity of implementing continued improvements to its perceived operation whilst also ensuring that obvious problems and potential faults are removed before construction. The construction phase entails the manufacture and assembly of the robots circuits, hardware and chassis with the software and programming aspects then implemented. The later concludes the robots production where the final maintenance considerations can be determined. These are essential for ensuring the robots continued serviceability. The robot's platform is the base on which the sensors, control system, and motors are mounted. The robot's stability is enhanced by its ability to maintain balance on uneven surfaces. Self-balancing robots have a wide range of applications, including entertainment, transportation, and search and rescue operations.

## Keywords

Self-balancing, Arduino ,Gyro sensor,DCmotor.

**ICIRIST-IRP-208**

# AUTOMATIC PORTER ROBOT FOR AIRPORT TERMINALS

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## ABSTRACT

The model of a baggage carrying robot that can autonomously navigate from its parking place to the passenger at the airport and follow the passenger by avoiding the obstacles in its path. In airports, trolleys are used by the passengers to carry the baggage during check-in or exit. It becomes very difficult when the passenger has to carry a large amount of luggage as well as need to take care of their children or elderly people. Under these circumstances, the proposed autonomous robot, here named Smart Luggage Robot will be of great help. The robot is equipped with a GPS system that navigates the robot from its parking location to the passenger who has booked it using a mobile app. After loading the baggage, the user/passenger enable the app and the robot follows the passenger up to the check-in or exit point. The robot finally generates the bill based on the distance and weight of the baggage. we explained how robots can act in concert with human behavior. To develop a robot capable of maneuvering through busy airports behind its owner while handling his or her luggage. In order to follow a human, a mobile robot needs to know the position of the person and must be able to determine its own path in order to follow his target. We consider a method using an transmitter &receiver. In order to prevent collision with obstacles, ultrasonic sensors are used to detect objects that may be in its path. To discusses the hardware and software components used to build the robot, and also presents an obstacle avoidance algorithm for the robot to follow the passenger. The built prototype has been successfully tested at the airport.

## Keywords

luggage follower, Arduino, ultrasonic sensors, GPS module

**ICIRIST-IRP-209**

# DESIGN AND FABRICATION OF AN UNDERWATER ROBOT

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## ABSTRACT

That can goes underwater in deep and be able to identify and repair the localized problems of the underwater portion of the structures like, Pen-stock, Dam, Turbine, Surge shaft etc in a Hydro Power Project. This innovative An underwater robot is a robot that can explore the water bodies with ease. Here we design a robot technology aims to eliminate the need for human deep divers, reducing risk and operational costs while enhancing the efficiency and sustainability of hydro power projects. The ROV equipped with several sensors and cameras to inspect and navigate through underwater. This project seeks to pioneer an affordable, homegrown solution that empowers underwater exploration to proactively manage and maintain their underwater infrastructure, ensuring the sustainability of clean energy generation whiles safe guarding the environment and human lives from the risk associated with deep-diving intervention. This underwater robot are mainly designed and fabricate to reduce the complexity and the risk of human life and also automate the work that have a repeatable nature.

**Keywords**

ROV, Underwater Robot, Deep Diving, Safety.

**ICIRIST-IRP-210**

# Optimizing Wind Turbine Blade Design for Enhanced Energy Efficiency in Industrial Aerodynamics

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## ABSTRACT

The critical role of aerodynamics in industrial applications, with a specific focus on wind turbine technology to enhance its performance. The objective is to optimize the design of wind turbine blades to improve overall energy efficiency. Through advanced computational simulations and experimental validations, we explore novel aerodynamic profiles and configurations. The study emphasizes the impact of various factors, including airfoil shapes, twist angles, and chord lengths, on the performance of wind turbines within industrial settings. The findings provide valuable insights for engineers and researchers working towards sustainable energy solutions, offering a pathway to maximize power output while minimizing environmental impact in the realm of industrial aerodynamics.

**Keywords**

Wind turbine blade, airfoil shapes, twist angles, chord length.

**ICIRIST-IRP-211**

# ADVANCEMENT IN LIGHTWEIGHT STRUCTURAL COMPONENTS OF AIRCRAFT


## ABSTRACT

Recent advances in aircraft materials and their manufacturing technologies have enabled progressive growth in innovative materials such as composites. Al-based, Mg-based, Ti-based alloys, ceramic-based, and polymer-based composites have been developed for the aerospace industry with outstanding properties. The use of lightweight materials improves mechanical properties and fuel efficiency, flight range, and payload, as a result reducing the aircraft operating costs. Thus, researchers are working on the development of materials with optimized properties for weight reduction, fatigue resistance, corrosion resistance, and enhanced damage tolerance. The proper selection of the material is crucial in designing the aircraft structure. However, these materials still have some limitations such as insufficient mechanical properties, stress corrosion cracking, fretting wear, and corrosion. Subsequently, extensive studies have been conducted to develop aerospace materials that possess superior mechanical performance and are corrosion-resistant. Such materials can improve the performance as well as the life cycle cost. Reducing structural weight is one of the major ways to improve aircraft performance. Lighter and/or stronger materials allow greater range and speed and may also contribute to reducing operational costs.significant growth in the development of new aircraft materials. The design specifications for aircraft structural materials demand that the materials should be damage tolerant and possess improved mechanical properties under various operating conditions. In recent times, the need for the development of MMCs for high-performance aircraft structures has rapidly increased.Among all metallic composites, titanium has been proven to withstand high temperatures.To overcome the existing limitations, the development of new advanced materials with different combinations of high strength, improved stiffness,and low density has become inevitable. To improve the applicability of MMCs in airframe construction and to withstand competition with the present polymer composites, significant investigations are required to evaluate their mechanical and structural performance. Moreover, this can be accomplished by increasing the strength-to-weight ratio or by reducing the absolute weight of the components.

**ICIRIST-IRP-212**

# OPTIMIZING AEROSPACE PERFORMANCE: AL6065 T6-LI ALLOYS FOR ENHANCED MECHANICAL PROPERTIES AND COST-EFFICIENT WEIGHT REDUCTION

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## ABSTRACT

The ultimate goal of the paper is to amend the mechanical properties of composite material utilized in the Aerospace industry. By considering in the properties in Al 6xxx series; we came to ken that Al6065 alloy has the better property. Incrementing payload and fuel efficiency of aircraft have become a major issue for the aerospace industry, which has boosted the development of more advanced materials with high concrete properties. Among the materials is the incipient generation of low -density Li-Al alloys. Additament of Li to Al6065 reduces the weight of aerospace alloys, since each 1 wt.% Li integrated to Al6065 reduces density by 3% and increment in elastic modulus. Al6065 T6-Li alloys use in aircraft applications, where the weight savings affected by utilizing these low-density alloys greatly reduce the conveyance fuel costs and increases performance. Fatigue crack magnification resistance in Al6065 T6-Li alloys generally is very high; this is paramount in damage-tolerant structures such as lower wing surfaces. Further weight reductions could be achieved if the adscititious benefits of these alloys such as incremented damage tolerance are felicitously considered

**ICIRIST-IRP-213**

# NON CORROSION CONTAINER FOR PROPELLANTS

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## ABSTRACT

In the field of rocketry and aerospace engineering, the safe and efficient storage of propellants is of paramount importance. Propellants, which often include corrosive substances, demand specialized containers to prevent degradation, leakage, and the potential for catastrophic accidents. This abstract discusses the development and significance of non-corrosion containers designed for the storage and transport of propellants.Traditional containers made from materials such as mild steel are susceptible to corrosion when exposed to the corrosive nature of propellants. The use of non-corrosion containers, constructed from materials such as high-density polyethylene (HDPE), composite materials, or specialized coatings, addresses this critical issue. These containers are engineered to resist corrosion, ensuring the integrity of the stored propellants and safeguarding personnel, equipment, and the environment.Key considerations in the design of non-corrosion containers include material selection, container construction techniques, and compliance with safety regulations. The implementation of non-corrosion containers minimizes the risk of accidental spills, leaks, and contamination, making them a vital component in propellant handling and storage.This abstract underscores the importance of non-corrosion containers in enhancing the safety and reliability of propellant storage, a crucial aspect of space exploration, defense, and the broader aerospace industry. It also highlights the ongoing research and development efforts aimed at improving the design, materials, and capabilities of these containers to meet evolving requirements and ensure the continued progress of space exploration and rocketry.

**ICIRIST-IRP-214**

# Experimental Investigation on Cooling of PV Panel using PCM with Nano Materials in Solar Power Plants

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**ABSTRACT**

The Solar Power Plant is designed for converting Solar Energy into Electrical Energy. The Solar Energy is renewable, ample and it can be used without causing any air and water pollution. Also it will not contribute any Global Warming. The Photovoltaic Technology (PV) is used to convert directly the sun light into electricity. The PV uses the panels of semiconductor cells to directly generate electricity. The PV Panels usually work from semiconducting material when the photons of sunlight hit the materials, the free electrons generated. The flow free electrons will flow through the materials will generate electricity. Some of the radiation falling on surface of the PV cell turns into electricity, remaining absorbed the PV cell. This in turns elevates the surface temperature. As we know the Efficiency of photo voltaic (PV) panels decreased as their temperature increased. So effective cooling of them is necessary. The cooling of PV- Panels based on phase change materials with Nano Materials is emerging cooling method that has recently received the attention. The PV Panels yields the highest output energy if the cooling starts when the temperature of PV panel reaches the maximum temperature. If the temperature reduces, the power output and efficiency will also increase. Our Prime aim is to investigate the best suitable method of cooling process by PCM with nano materials. Detailed analysis and investigation study need to improve the performance of PV Panel when using PCM with nano materials which is having higher thermal conductivity will be helpful to increase the efficiency.

ICIRIST-IRP-215

# DESIGN AND CONTROL OPTIMIZATION OF A FLAPPING - WING UNMANNED MICRO AIR VEHICLES


## ABSTRACT

Flapping-wing unmanned micro air vehicles (FWUMAVs) have the capability of performing various flight modes like birds and insects. Therefore, it is necessary to understand the various flight modes of FWUMAVs in order to fully utilize the capability of the vehicle. The unique flight modes of FWUMAVs can be studied through the trajectory optimization. This paper proposes a trajectory optimization framework of an FWUMAV. A high-fidelity simulation model is included in the framework to sufficiently consider the complicated dynamics of the FWUMAV. The unsteady aerodynamics are modeled with the unsteady panel method (UPM) and the unsteady vortex-lattice method (UVLM). The effect of wing inertia is also considered in the simulation model. In this study, transition flight trajectories are searched with the proposed framework. An optimal control problem is formulated for the transition flight from hovering to forward flight and transcribed to the parameter optimization problem with the direct shooting method. The cost function is defined as energy consumption. The same converged solution can be obtained with different initial guesses. The optimization results show that the FWUMAV utilizes the pitch-up maneuver to increase altitude, although the forward speed is reduced. This pitch-up maneuver is performed more actively when the target velocity of transition is low, or the wind condition is favorable to acceleration.This project presents the design of a Flapping wing UMAV which is inspired by various bird mechanism and its action during flight. In this project, the real actions have been tried to convert into a perfect mechanism in order to get a stable flight manuvering. Biomemic plays a major role in this design. The design has been made CATIA V5 with all the parameters calculated according to the bird selected. The moving mesh analysis is completed with the help of ANSYS. This UAV can be widely used for surveillance for civilian and military applications.

**ICIRIST-IRP-216**

# A REVIEW OF FINGERPRINT RECOGNITION USING IMAGE PROCESSING


## ABSTRACT

Mortal fingerprints are rich in details called ramifications, which can be used as identification marks for point verification. For both particular and marketable protection, security has always been a major concern, and multitudinous results are available to address the problem. The thing of this design is to develop a complete system for point identification and recognition through rooting and matching ramifications. To achieve good ramifications birth in fingerprints with varying quality, preprocessing in form of image improvement and binarization is first applied on fingerprints before they're estimated. Numerous styles have been combined to make a minutia extractor and a minutia matcher. Minutia marking with special consideration of the triadic branch counting and false ramifications junking styles is used in the work. An alignment- grounded elastic matching algorithm has been developed for minutia matching. This algorithm is able of chancing the correspondences between input minutia pattern and the stored template minutia pattern without resorting to total hunt. Performance of the advanced system is also estimated on a database with fingerprints from different people. The ideal of this study to apply point recognition algorithm. The Region of Interest( ROI) for each point image is uprooted after enhancing its quality. The conception of Crossing Number is used to prize the minutia, followed by false ramifications elimination. An alignment grounded matching algorithm is also used for minutia matching

**ICIRIST-IRP-217**

# Study of Velocity and Compressibility of Ultrasonic Waves in different Liquid at Room Temperature

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**ABSTRACT**

Ultrasonics sound waves having frequency more than 20 KHz. The audible range of frequency of sound lies between 20 Hz to 20,000 Hz. Velocity of sound increases with temperature. In this paper detail study with velocity, density and compressibility of ultrasonic waves in different liquid (Methanol, Ethanol and propanol) at room temperature during month of November 2023 to December 2023 by using ultrasonic interferometer.

**Keywords**
Interferometer, ultrasonic, voltage, frequency.

**ICIRIST-IRP-218**

# Smart Sensing Technology for Real Time Load Analysis in Large Structures

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**Abstract**

The field of structural health monitoring has long been integral to ensuring the safety and longevity of large structures like bridges, high-rise buildings, and industrial facilities. Traditional methods of monitoring rely heavily on periodic manual inspections and basic electronic monitoring systems, which often fail to detect subtle or rapid changes in structural integrity. With the increasing complexity of modern architecture and the growing demand for sustainable and safe infrastructure, there is a critical need for more advanced, real-time monitoring solutions. The invention relates to a smart sensing system for real-time load analysis in large structures. It integrates advanced sensor technology, sophisticated data processing algorithms, and Internet of Things (IoT) connectivity to continuously monitor and analyze structural health. This system enhances safety, reduces maintenance costs, and increases the lifespan of structures by providing proactive, real-time insights into structural integrity.

**Keywords:**

load analysis, IoT, data processing, sensors.

**ICIRIST-IRP-219**

# Preparation and Study of Zinc Oxide Nanoparticles (NP's) by Chemical Method

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## ABSTRACT

Zinc Oxide nanoparticles (np's) were prepared over the dielectric substrate by chemical method which prepared by molar concentrations at various temperatures. The surface morphology and structure of the prepared nanoparticles were characterized by Scanning Electron Microscope (SEM) to confirm the presence of nanoparticles (np's), X-ray diffraction (XRD) were performed for finding size of the particles. The forbidden band gap of the nano materials were characterized by UV-Visible spectroscopy in which the value of 3.2eV. The electrical, optical and structural properties were studied.

**Keywords**

ZnO nano particles, electrical, optical and structural properties.

**ICIRIST-IRP-220**

# IoT-enabled Precision Wildlife Management for Enhanced Crop Protection and Health Surveillance

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## ABSTRACT

The IoT-enabled Smart Agriculture and Animal Monitoring System is an integrated network of sensors and devices designed to oversee and manage various facets of agriculture and animal farming. By employing sensors, farmers can effortlessly monitor critical field parameters such as soil moisture, temperature, and humidity remotely via a dedicated mobile application. This empowers farmers to make informed decisions regarding essential tasks like crop watering, allowing them to control motor pumps directly from the mobile app. Recognizing the significance of safeguarding crops from local animals such as buffaloes, cows, goats, and birds, the system introduces an innovative Automatic Crop Protection feature. Utilizing artificial intelligence-based animal recognition technology and a webcam, the system detects approaching wild animals near the fields. Upon detection, the system triggers a buzzer to deter the animals, ensuring the safety of crops. Simultaneously, an image of the recognized animal is sent to the owner's email address, providing real-time alerts and allowing for swift response measures. This comprehensive approach not only prevents significant losses for farmers but also eliminates the need for constant human presence in the fields

**ICIRIST-IRP-222**

# A TECHNICAL APPROACH TO CHANNEL MODELING FOR VEHICULAR VISIBLE LIGHT COMMUNICATION USING MACHINE LEARNING

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## ABSTRACT

Intelligent Transportation Systems (ITS), visible light communication (VLC) has come out as a potential medium to enable wireless connectivity in vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I). Optical Wireless Communication (OWC) propagation channel characterization plays a major role in the design and performance analysis of Vehicular Visible Light Communication (VVLC) systems. Adoption of LEDs in multiple fields like indoors and outdoors done. From the context of this project study LEDs can be used in vehicles like car and bike, traffic signalling lights, Tx, Rx and street lighting. LEDs are lighting component and VLC's base is LED only, In future there are various new opportunities to be explored related to ITS, some of them already developed or some are under development worldwide. Predicting the performance of vehicular communication networks is challenging because of external influencing factor like mobility induced vibration, optical turbulence, and road reflection mobility, intravehicular distance, weather condition that affects optical wireless channel (OWC) between the transmitter and the receiver. This work is focusing on Path loss model which are widely used in study of wireless channel for intelligent transportation system. Path loss simulation results are further used to predict path loss using Machine learning (ML)algorithm. Here simulation and performance comparison between Path loss model using different physical parameters, at a same time which Machine Learning algorithms gives best RMSE. In the end discussion on various aspects that deserve attention while using such data-driven prediction models along with applications of V2V path loss prediction.

## Keyword

Intelligent Transportation Systems (ITS), visible light communication (VLC), Optical wireless channel (OWC), Vehicular visible light communication (VVLC), Machine learning (ML), Bit error rate (BER), etc.,

**ICIRIST-IRP-223**

# COMPACT SLOT ANTENNA FOR UWB APPLICATIONS

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## ABSTRACT

In this paper, we propose a novel compact ellipse patch radiator and CPW (Coplanar Wave Guide) fed antenna for UWB applications. The proposed antenna has very compact size of 18×18 mm² is used for ultra wideband applications. The antenna substrate thickness IS 0.8mm. The proposed antenna consists of two symmetrical half slot antenna elements with coplanar waveguide – fed structures and y shaped slot that is cut at the bottom center of the common ground plane. The slot efficiently prevents the current from directly flowing between two ports at low UWB frequency. The antenna covers 1.6 to 14 GHz. This proposed antenna has been studied using Finite Element Method (FEM) numerical techniques. This proposed structure is a high directive gain, low-cost, low weight antenna. The characteristic analysis such as return loss (RL), VSWR and radiation pattern of this antenna has been investigated numerically. Numerical study has been carried out by using Ansoft HFSS V13 simulating software. The proposed antenna also contains relatively stable radiation pattern and gains.

## Keyword

CPW (Co Planar Waveguide), half slot, UWB (Ultra Wide Band), Multi band.

**ICIRIST-IRP-224**

# DETECTION AND CLASSIFICATION OF DIABETIC RETINOPATHY USING DEEP LEARNING

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## ABSTRACT

Diabetic retinopathy (DR) is a leading cause of blindness in diabetic patients. Early detection and classification of DR can facilitate timely treatment and reduce the risk of vision loss. In recent years, deep learning has shown promise in automating the diagnosis of DR. However, the use of high-performance models such as ResNet and DenseNet often requires powerful computing resources and large amounts of data. In this study, we propose a deep learning approach for the detection and classification of DR using MobileNetV2, a lighter and more computationally efficient model. Our method was trained and tested on a large publicly available dataset, achieving an accuracy of 85.28% for DR classification. We also conducted experiments to investigate the importance of different hyperparameters and data augmentation techniques. The results demonstrate the effectiveness of our method in detecting and classifying DR with high accuracy while using fewer computational resources. The proposed method has the potential to be applied in clinical settings to assist ophthalmologists in the early detection and diagnosis of DR.

**ICIRIST-IRP-225**

# Build a Micro Strip Patch Antenna with Circular Polarization for Ku Band Utilization.

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## ABSTRACT

A hybrid patch antenna featuring a reduced slot-loaded ground plane and a broadband "HEART" form is suggested in this article. A standard circular patch can be effectively upgraded to a "HEART" shape by positioning two circular radiating pieces at key locations on the patch. Two precisely positioned rectangular holes on the decreased ground plane allow for proper impedance matching over a variety of frequencies. These methods work together to introduce high gain, low profile, and broadband antenna design. The electrical and physical dimensions of the proposed antenna are 0.266λ × 0.241λ × 0.0108λ and 29 mm × 32 mm × 1.6 mm, respectively. The wavelength of the minimum operational frequency is indicated by the symbol λ. With an impedance bandwidth of 5 GHz from (4.8 GHz to 16.8 GHz), the suggested antenna resonantly functions at the following frequencies: 4.8 GHz, 10.9 GHz, 11.4 GHz, 14.1 GHz, 15.2 GHz, and 16.8 GHz. 100% fractional bandwidth, 3.6dBi peak gain, and stable enough E and H field patterns are attained at 5.5 GHz and 6.9 GHz. On the other hand, the design and simulation of the displayed antenna are done using HFSS software. The recommended antenna is designed using the low-cost FR-4 substrate (1.6 mm in height, 0.02 loss tangent, 4.4 dielectric constant). After that, it is investigated with a standard microwave measurement device. Numerous frequency bands, ranging from 3.3 to 5.5 GHz, including WiMAX (3.4–3.6 GHz) A wide range of frequency bands could find application for the proposed antenna, including WiMAX (3.4–3.6 GHz and 5.5 GHz), from 3.3 GHz to 4.2 GHz n77 frequency band, from 3.3 GHz to 3.8 GHz n78 frequency band, from 4.4 GHz to 5 GHz n79 frequency band, and from 5.08 GHz to 5.73 GHz Wireless local area network frequency band. It also covers the 5G-V2X band (3.3-5GHz) and LTE 46 band (5.15-5.925GHz), object placement, high-bandwidth communications, and short-range remote sensing.

**ICIRIST-IRP-226**

# ECG SIGNAL BASED KIDNEY DISEASE PREDICTION SYSTEM USING MACHINE LEARNING

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## ABSTRACT

Sudden Cardiac Death (SCD) is one of the life-threatening issues that causes sudden mortality rate. It is observed that 70% died of cardiovascular diseases and 20% died of SCD in dialysis patients. We introduce a novel SVM classification algorithm to detect the SCA in CKD patients. At first, ECG signals image are collected from two databases. Since the collected ECG input is more prone to noises, and thus removed by band pass filter. It converts into linear pass filter. Then, wavelet features are collected from the signals using QT and RR intervals of Berger's algorithm. The selected features are then fed into the SVM classifiers which effectively classify the normal and abnormal signals of CKD patients. With the help of convolution operator, feature maps are generated and thus, it easily learns the features. Experimental results have shown the classification accuracy of 97.6%.

## Keywords

Sudden Cardiac Death(SAD),Chronic kidney diseases(CKD), ECG signal data,SVM Classifier .

ICIRIST-IRP-227

# ELECTRONIC AUTOMATED DEFIBRILLATOR RESCUE ROBOTAMBULANCE FOR MEDICALSERVICE IN METROPOLIS

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## ABSTRACT

Metropolis cities actually require the state-of-the-art technologies that can contribute smart service in various condition, and robotic systems are one of the key solutions for such requirements. Present moment is a basic issue while managing individuals who knowledge an abrupt heart failure that sadly coulddie because of detachment of the deadlock treatment. Accordingly, an quick treatment utilizing Automated External Defibrillator(AED) should be directed to the casualty inside a couple minutesafter imploding. Thus we have planned and created theRescue Robot, abbreviated as Ambubot, which brings along anAED in an abrupt occasion of heart collapse and works with variousmodes of activity .The model with biomedical sensors are enforced for countering the patient wellbeing persistently, the range of the patient can likewise be followed if there should be an occurrence of crisis through GSM.The article of the design and evolution of such robot are presented in this paper.

## Keywords

Rescue Robot, Smart Healthcare, Metropolis, Emergency Management, AED

**ICIRIST-IRP-228**

# INNOVATIVE SOLUTIONS FOR AMNIOTIC SAC RUPTURE DETECTION AND LABOR PAIN MONITORING

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## ABSTRACT

Childbirth is a complex process involving multiple stages, one of which is the rupture of the amniotic sac. Detecting the timely rupture of the sac and monitoring labor pain are crucial for ensuring the health of both the mother and the baby. Carelessness or neglect in addressing the rupture of the amniotic sac can lead to several disadvantages and potential complications during pregnancy and childbirth. It's crucial for pregnant individuals and healthcare providers to take the rupture of the amniotic sac seriously and respond promptly. To mitigate these disadvantages and potential complications, it is essential for pregnant individuals to be informed about the importance of seeking immediate medical care when the amniotic sac ruptures. Traditional methods for detecting amniotic sac rupture, such as visual inspection or nitrazine paper tests, may not be reliable or timely. Additionally, monitoring labor pain objectively can be challenging. In this context, the proposed system incorporates pH sensors to detect the rupture of the amniotic sac promptly This early detection enables healthcare providers to take immediate action to reduce the risk of infection and other complications and Force sensors are integrated into a wearable device that the mother can wear during labor. These sensors measure uterine contractions and provide objective data on the intensity and frequency of contractions. The data are displayed on a user-friendly interface for healthcare providers to monitor the progress of labor.

## KEYWORDS

Force sensor, Amniotic fluid breakage ,Intrauterine contractions, pH Sensor, Alerting system.

**ICIRIST-IRP-229**

# Heart Rate Variability-Based Driver Drowsiness Detection: Validation through EEG Comparison for Enhanced Road Safety

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## ABSTRACT

Driver drowsiness detection is a crucial technology aimed at averting potentially fatal car accidents resulting from drowsy driving. This study introduces an innovative algorithm for detecting driver drowsiness, leveraging heart rate variability (HRV) analysis. The proposed method is rigorously validated through a comparison with electroencephalography (EEG)-based sleep scoring. Sleep conditions significantly influence the autonomic nervous system, subsequently affecting HRV, represented as RR interval (RRI) fluctuations in an electrocardiogram trace. The algorithm monitors eight HRV features to detect changes by employing multivariate statistical process control, a well-established anomaly detection method. The algorithm's performance was assessed through experiments conducted on a driving simulator. RRI data were collected from 34 participants during driving sessions, and their sleep onsets were identified using EEG data interpreted by a sleep specialist. The validation revealed that the proposed algorithm successfully detected drowsiness in 12 out of 13 pre-N1 episodes preceding sleep onsets, with a false positive rate of 1.7 occurrences per hour. This study also highlights the applicability of the HRV-based anomaly detection framework initially designed for predicting epileptic seizures. The findings underscore the effectiveness of the proposed method in preventing accidents resulting from drowsy driving. The introduced algorithm, grounded in HRV analysis, presents a significant contribution to mitigating accidents associated with driver drowsiness. Its successful validation against EEG-based sleep scoring enhances its credibility and potential impact on real-world driving scenarios. This study also highlights the applicability of the HRV-based anomaly detection framework initially designed for epileptic seizure prediction. The proposed method exhibits promise in significantly reducing accidents attributable to drowsy driving. The presented algorithm holds potential for substantial contributions in preventing accidents caused by driver drowsiness, emphasizing the critical role of HRV-based anomaly detection in enhancing road safety.

## Keywords

Heart rate variability, EEG, Feature extraction, Biomedical monitoring, Drowsy driving detection, anomaly detection, multivariate statistical process control, etc.,

**ICIRIST-IRP-230**

# CRAFTING AN ULTRA-WIDEBAND (UWB) MICROSTRIP PATCH ANTENNA FOR APPLICATIONS IN WIRELESS POWER TRANSFER

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## ABSTRACT

This proposal aims to design and develop a microstrip patch antenna array for Wireless Power Transfer (WPT) applications. The use of a reinforced, nonflexible, and hydrophobic jute substrate, treated with conductive polymer sodium alginate, is explored for enhanced electrical and mechanical properties. Comparative analysis with a conventional FR4 substrate demonstrates the proposed antenna's effectiveness in the ultra-wideband spectrum (3.1 to 10.6 GHz) for a Far-Field Charging Unit (FFCU). The 4x4 micro patch array antenna exhibits high efficiency in focusing electromagnetic energy toward targeted user terminals. Crafted with conducting copper tape on the reinforced jute substrate, the antenna shows promising results for wireless charging applications. Simulation testing, despite the unknown dielectric constant of the substrate, validates its performance against commercial substrates with similar structures. This environmentally friendly, flexible, and cost-efficient organic UWB antenna represents a significant stride towards sustainable wireless power transfer solutions.

**ICIRIST-IRP-231**

# Machine Learning for Harvest Inspection and Supervision in an Internet of Things-based Intelligent Agricultural System

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## ABSTRACT

Ethiopia, a nation of 94 million people, is largely dependent on agriculture, which accounts for 45% of its GDP and employs 85% of its workforce. But conventional farming methods are running out of steam to meet a developing country's needs. A move toward sustainable and high-tech farming practices is required because an increased reliance on pesticides has a negative impact on soil health. In order to improve productivity and sustainability, Ethiopian agriculture urgently needs technical innovations. This article emphasizes this point. With a focus on cutting-edge technologies like deep learning, artificial intelligence (AI), machine learning (ML), and wireless communications, the goal is to understand and predict crop performance in a variety of environments. By utilizing these developments, the research hopes to overcome the problems presented by conventional methods and promote sustainable development by advancing Ethiopian agriculture into a more resilient, efficient, and ecologically conscious future.

**Keyword**

Soil and Health monitoring, Humidity level, Temperature, Machine Learning, Cloud Services.

**ICIRIST-IRP-232**

# MRI-based Brain tumor detection using convolutional Deep learning methods

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## ABSTRACT

Technologies that are specifically employed for diagnostic purposes in the field of medical science are used in the detection of brain tumors, since radiologists are finding that it is increasingly difficult and time-consuming to identify errors in MRI scanning. It is imperative to address common defects found after tumor screening in order to prevent more difficulties. One of the most recent technological developments is MRI scanning. One important person in the diagnosis of the brain tumor is the radiologist. Radiologists must carefully review each image to prevent mistakes in the diagnosis of brain tumors. There's a chance that cerebral fluid could occasionally show up on an MRI scan as mass tissue. The model suggested in this study makes use of a machine learning technique, which enhances the reliability of the MRI scan picture classification. The goal of the research is to develop an automated system that performs a crucial function in identifying the presence or absence of a brain mass. In order to avoid further problems in MRI images for brain detection, the study attempts to address the fundamental defects in detection. This study's primary goals are to train the algorithm on a larger dataset and, with the aid of numerous fresh datasets, verify the validity at the patient level.

**ICIRIST-IRP-233**

# Block Access Control in Wireless Blockchain Network: Design, Modeling and Analysis

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## ABSTRACT

A wireless blockchain network is suggested to facilitate a distributed and secure wireless network for a variety of blockchain applications. One crucial step to reach blockchain consensus in a wireless network is the broadcasting of a new block via a wireless channel. The transmission of the block will be significantly influenced by wireless network protocols. In this study, we concentrate on the consensus process in a blockchain-based wireless local area network (B-WLAN) by examining the effects of the media access control (MAC) protocol, CSMA/CA. Due to the randomness of the backoff counter in CSMA/CA, it's feasible for subsequent blocks to overtake or keep pace with the previous one, which exacerbates the blockchain forking issue. As a result, we suggest mining strategies to halt mining in order to decrease the likelihood of forking, and a discard strategy to eliminate the forking blocks that already exist in the CSMA/CA backoff procedure. We develop Block Access Control (BAC) methods based on these strategies to effectively schedule block mining and transmission, thereby enhancing B-WLAN performance. Following that, we present Markov chain models to perform performance analysis in B-WLAN. The findings indicate that BAC methods can assist the network in achieving high transaction throughput while improving block utilization and conserving computational power. The trade-off between transaction throughput and block utilization is also shown, which can serve as a guide for the practical implementation of blockchain.

**Keyword**
Blockchain, wireless network, CSMA/CA, forking, Markov chain, performance analysis.

**ICIRIST-IRP-234**

# Poincaré Analysis based on Short-term Heart Rate Variability Data for Stress Evaluation

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## ABSTRACT

Dynamic changes in autonomic stress responses may provide details on autonomic nervous system functions. Time-varying evaluation can be achieved with a sliding window, however, in order to learn dynamic changes, an evaluation method needs to not only conduct calculation with a short sliding step but also derive evaluation indices with a narrow window. Stress analysis using HRV data shorter than one minute is still a challenge in this field. This paper investigates a Poincaré plot analysis method for stress evaluation based on short term heart rate variability (HRV) data. First a sliding window, with no overlap, is used to segment data in order to form Poincaré plots. Then a simple index, which corresponds to mean distance between two adjacent points in the plot, is calculated on each evaluation window. The window length is defined with time duration and four lengths are examined in this paper, namely, 15, 30, 45, and 60 s. Two mental stress induction experiments, mental arithmetic and Stroop color-word tests, are utilized to validate the proposed method.

## Keywords

Stress, Heart Rate Variability, Indexes, Rail to Rail inputs, Continuous Wavelet Transforms, Physiology, Electrocardiography.

**ICIRIST-IRP-235**

# POST-OPERATIVE HIP FRACTURE REHABILITATION MONITORING AND RECOVERY SYSTEM

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## ABSTRACT

Hip fractures are a common injury among the elderly, and the recovery process can be challenging, especially after surgery. Post-operative rehabilitation is crucial for patients to regain mobility and independence. Traditionally, rehabilitation progress is monitored through physical therapy sessions and regular check-ups with doctors or physicians. However, this method is time-consuming, expensive, and does not provide real-time monitoring of patients' recovery progress. To address the limitations of traditional rehabilitation monitoring methods, we propose a post-operative hip fracture rehabilitation monitoring system that utilizes the thermoelectric effect of a Peltier crystal. The system incorporates IoT-based movement detection sensors such as an accelerometer, tilt sensor, and EMG sensor to monitor hip movement. By incorporating IoT-based movement detection sensors, the system provides real-time monitoring of hip movement, and the Peltier crystal aids in the recovery process by regulating blood flow. The system's ability to identify the recovery percentage provides doctors and physicians with valuable data to monitor patients' progress and adjust rehabilitation programs accordingly.

## Keywords

Health monitoring, Hip fracture rehabilitation, Peltier crystal, Tilt sensor.

ICIRIST-IRP-236

# Vision-Based Daytime Brake Light Detection: Advancing Vehicle Safety through Automated Smart Systems

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## ABSTRACT

An automatic red light running detection system is a crucial component in vehicle safety, playing a pivotal role in preventing accidents. Maintaining the brake system in optimal condition is paramount for overall safety, emphasizing the need for early detection of defects to prevent failures. Simulations of both normal and faulty brake conditions have been conducted using MATLAB, utilizing a brake transfer function. The escalating concern for advanced vehicle safety has prompted extensive research into developing systems that assist drivers in various capacities. With the global surge in car ownership, drivers increasingly seek automatic and semi-automatic vehicle-mounted systems for enhanced safety. Driver assistance systems have evolved to warn drivers about potential hazards by leveraging sensors and/or cameras to analyze the surrounding environment. In addressing these safety concerns, we propose a vision-based daytime brake light detection system utilizing a driving video recorder, a technology becoming more widely adopted. Daytime conditions provide enhanced visibility of visual features, motions, and vehicle appearances. The system employs Gaussian Mixture Model (GMM) for background subtraction, identifying connected foreground pixels and categorizing a segment as a vehicle if it surpasses a predefined threshold. The integration of such vision-based detection systems is crucial for enhancing vehicle safety during daytime driving. By leveraging advanced technologies and signal processing techniques, our proposed system aims to contribute to the development of robust and effective solutions for detecting brake light conditions, thereby minimizing the risk of accidents and ensuring the overall safety of drivers and passengers alike. This innovative approach leverages visual cues during daylight hours to enhance the accuracy of brake light detection. By utilizing a driving video recorder and sophisticated algorithms, the system aims to contribute significantly to vehicle safety, providing timely warnings and mitigating potential risks on the road.

## Keywords

Vehicle safety, Road safety, Gaussian Mixture Model (GMM), Driver assistance systems, Vision-based detection systems, Automatic vehicle-mounted systems, etc.,

**ICIRIST-IRP-237**

# Analyzing Fetal Ultrasound Images: A Comprehensive Exploration of Deep-Learning Algorithms

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## ABSTRACT

Deep-learning algorithms are increasingly used to process foetal ultrasound images. Despite the huge number of survey studies already published in this subject, the most of them focus on a broader domain of medical image analysis or do not include all foetal US DL applications. This study covers the most recent work in the topic, including 145 research papers released after 2017. Each study is analysed and discussed from both a technique and application standpoint. We categorised publications into three categories: (i) foetal standard-plane identification, (ii) anatomical structure analysis, and (iii) biometry parameter estimate. Each category highlights its primary limits and open issues. Summary tables are supplied to compare different approaches. The article also summarises publicly available datasets and metrics used to evaluate algorithm performance. This paper summarises the current level of DL algorithms for foetal US image analysis and discusses problems for researchers in translating research methods into clinical practice.

## Keywords

Fetal ultrasound processing, deep learning, sur-vey, biometry estimation, plan detection, anatomical-structure analysis.

ICIRIST-IRP-238

# FIRED CLAY BRICK PARTIAL DOPED WITH COCONUT SHELL ASH

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## ABSTRACT

This study experimentally analyzed the engineering properties of the fired clay-coconut shell ash bricks. In this study 0 to 20% of coconut shell ash was blended with the brick clay. Main focus of this research was to utilize the natural agro waste for environmental protection, introducing low-cost eco-friendly building materials as well as to improve the self-employments by practicing the traditional brick making method. For the analysis dry density, compressive strength was conducted on fired clay bricks by following the standard recommended testing machineries. The results reveal that the mechanical and physical properties improve with the doping of coconut shell ash. However, the optimum value of coconut shell ash to be doped for the manufacturing of fired clay bricks were originates to be high. The percentage varies from 0%, 5%, 10%, 15% and 20%.

**Keywords**
Coconut Shell Ash, Clay Brick, Alternative Building Material, Water Absorption, Compressive Strength.

ICIRIST-IRP-239

# EXPERIMENTAL STUDY OF BAGASSE ASH INFUSED CEMENT AND GROUND GRANULATED BLAST FURNACE SLAG CONCRETE

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## ABSTRACT

Concrete's basic components are cement, fine aggregate, coarse aggregate, and water. Concrete is the primary component of modern building. As infrastructure has evolved, concrete has assumed an increasingly significant role. Concrete is used extensively during the construction of infrastructure, including as buildings, industrial structures, bridges, and highways. Researchers are investigating potential new concrete ingredient substitutes in response to this requirement. It has been proven that substituting different mineral admixtures for cement increases concrete's strength and durability. Concrete admixtures are materials that are mixed with freshly-poured or already-hardened concrete to enhance particular properties like workability, durability, or early and final strength. Chemical admixtures reduce construction costs, change the characteristics of hardened concrete, and maintain the quality of concrete throughout mixing, transportation.

## Keywords

Cement, fine aggregate, coarse aggregate,bagasse ash, crushed granulated blast furnace slag

**ICIRIST-IRP-240**

# DISCORD BOT FOR STOCK TIMER

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## ABSTRACT

AI(Artificial Intelligence) is like giving a computer a brain. It allows machines to do things that normally require human intelligence, like learning, solving problems, and even creating things. A Discord bot is a software program that interacts with a Discord server. These bots can be programmed to perform a wide range of tasks. This project aims to develop a Discord bot catering to the financial needs of traders. It will provide real-timestock GV market information, including quotes, news, and analys is within the Discord platform. Users canaccessup-to-date stockprices, receive curated stock news,and request fundamental analyses and charts. Customizable alerts and notifications ensure users stay informed about specific stocks ormarket conditions.The bot will also feature an interactive trading simulation for risk-free strategy practice. Built using Python and Discord.py, the bot will leverage financial data APIs for accurate insights. The implementation of this project will yield a valuable tool seamlessly integrated into Discord, empowering traders and investors within formed decision-making capabilities.

**Keyword**

Real Time Stock , GV Market Informstion ,Quotes, Intractive and riskfree News and Analysis ,Customizable alerts and notification

**ICIRIST-IRP-241**

# TRIBOLOGICAL PROPERTIES OF CARBON REINFORCED AND SILICA REINFORCED FKM IN COMPARISON TO AISI 304 L STAINLESS STEEL

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## ABSTRACT

Fluoroelastomer rubbers (FKM) are widely utilized for sealing applications across various industries, including nuclear power plants, the automotive industry, household machinery, water pumps, and wind power plants. In the context of nuclear power plants, an Integrated System for the Inspection and ISI of the main vessel and safety vessel of PFBR has been developed, incorporating a free-roving four-wheeled methodology. This demonstrates the diverse applications of FKM in critical industrial settings, emphasizing their importance in ensuring operational safety and efficiency across different sectors. The VEN TURE is a remote-controlled robotic device with four wheels that performs non-destructive evaluations of welds and visually examines the external and internal surfaces of the main and safety vessel. Fluoroelastomers (FKM) are used as wheel material for the in-service inspection (ISI) vehicle and as leak-resistant barriers in rotating plugs in sodium-cooled, pool-type, 500 MV(e), Prototype Fast Breeder Reactor (PFBR). FKM is a vital sealing material in various industries, including nuclear power plants, the automotive industry, and others. The development of FKM backup seals for PFBR RPs has been accomplished through a collaborative effort involving more than 15 Indian agencies. The utilization of FKM in critical polymeric applications of PFBR, FBTR, and FCF has been developed. The wheel lining material is prone to sliding wear failure under challenging operating conditions. To address this, FKM rubber is strengthened with carbon and silica to improve its resistance to sliding wear. Dry sliding wear characteristics of Fluoroelastomers are examined under varying load conditions and sliding speeds using a Pin on Disc experiment, with an austenitic stainless steel AISI 304 L disc as the counter body. The resulting sliding wear plots are recorded and correlated with various wear parameters. The wear behavior of FKM rubber under thermal degradation has been examined, revealing the impact of high temperatures on its mechanical properties and abrasive wear performance. The widespread use of FKM in sealing materials across various industries underscores its significance in ensuring operational reliability and safety. In dry sliding wear tests, it was observed that carbon-reinforced FKM demonstrates greater wear resistance and improved frictional characteristics compared to silica-reinforced FKM. This research outcome is expected to be significant in the development of FKM wheel linings for the ISI vehicle of the PFBR, particularly from the perspectives of friction and wear

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