



# International Conference on Smart Intelligent Computing and Applications ( ICSICA - 2025)



## Editors:

Dr. R. Gopi

Dr. V. Thirupathy Kesavan

Dr. K. V. M. Shree

Mr. R. Govindasamy

Mr. D. Vijayakumar



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1800 889 9212  
Dhanalakshmi Srinivasan Engineering College  
(Autonomous)  
[www.dsengg.ac.in](http://www.dsengg.ac.in)  
Thuraiyur Road, Perambalur - 621 212,  
Tamil Nadu, India.

# About the Principal



**Prof. Dr. D. Shanmugasundaram** is the **Principal of Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur, Tamil Nadu**. With over 28 years of experience in engineering education, his research expertise spans powder metallurgy, energy, and composites. He has published numerous articles in international journals and conferences, and has been a keynote speaker at international conferences in Malaysia, Hong Kong, and Tokyo. Dr. Shanmugasundaram serves on editorial boards, reviews for reputed journals, and is a member of several professional societies.

# About the Editors



**Dr. R. Gopi** is a **Professor in the Department of Computer Science and Engineering at Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur**. He received his Ph.D. degree in the year 2019 and published more than 25 research articles in SCI and Scopus Journals, several articles in International Conferences and book chapters, published 5 patents and one patent granted in the year 2023. He has secured research grants from MeitY and for ATAL FDP. His research area are AI, Machine Learning, Big Data, Vehicular Adhoc Networks (VANET).



**Dr. V. Thiruppathy Kesavan** is **Professor and Head of Information Technology at Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur**, with 20+ years of academic experience. Since earning his Ph.D. in 2016, he has published more than 25 indexed journal articles including SCI and Scopus, 10 international conference papers, 2 indexed book chapters, and 15 national conference papers. He has secured research grants from AICTE RPS and TNSCST. His expertise includes Network Security, IoT, WSN, and Intrusion Detection Systems.



**Dr. Shree K V M** serves as **Professor and HOD of Artificial Intelligence and Data Science at Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur** since May 2023. With 25+ years in academia, research, and administration, she specializes in Wireless Networks and Computer Communication. Her distinguished career includes roles as Principal and Professor. Her scholarly contributions comprise 15 papers in reputed journals, presentations at IIT Kharagpur and Nanyang Technological University Singapore, and authorship of "Digital Communication".



**Mr. D. Vijayakumar M.E.,(Ph.D)** is currently serving as the **Head of the Department of Cyber Security at Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur**. With over 13 years of academic and administrative experience, he is pursuing Ph.D. in Anna University. He has published 2 patents, 4 international conference papers. He is acting as the coordinator of TNSCST and received the fund of Rs.150000 from TNSCST for the purpose of Science and Technology Capacity Building for Industrial Needs. Also, he is a NSS Programme officer in DSEC.



**Prof. R. Govindasamy M.Tech., (Ph.D)** is currently serving as the **Head of the Department of MCA at Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur**. With over 20 years of academic and administrative experience, he has made notable contributions to the field of computer applications. He is the author of a textbook on Object-Oriented Programming using C++. and published articles in reputed journals. He has held several key academic leadership positions and continues to mentor students with dedication.



## Proceedings of

# International Conference on Smart Intelligent Computing and Applications (ICSICA - 2025)

## Editors

**Dr. Gopi, R.**

Head of the Department

Department of Computer Science and Engineering

**Dr. Thiruppathy Kesavan, V.**

Head of the Department

Department of Information Technology

**Dr. Shree, K. V. M.**

Head of the Department

Department of Artificial Intelligence & Data Science

**Mr. Govindasamy, R.**

Head of the Department

Department of Computer Applications

**Mr. Vijayakumar, D.**

Head of the Department

Department of Cyber Security

**25<sup>th</sup> March, 2025**

**Dhanalakshmi Srinivasan Engineering College (Autonomous)**

**Perambalur, Tamil Nadu – 621 212.**

**[www.dsengg.ac.in](http://www.dsengg.ac.in)**

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Dr. Thiruppathy Kesavan, V. – HoD/ IT  
Dr. Shree, K. V. M. – HoD/ AI & DS  
Mr. Govindasamy, R. – HoD/ MCA  
Mr. Vijayakumar, D. – HoD/ CST

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## Editors

**Dr. R. Gopi**

Head of the Department  
Department of Computer Science & Engineering

**Dr. V. Thiruppathy Kesavan**

Head of the Department  
Department of Information Technology

**Dr. K. V. M. Shree**

Head of the Department  
Department of Artificial Intelligence & Data Science

**Mr. R. Govindasamy**

Head of the Department  
Department of Computer Applications

**Mr. D. Vijayakumar**

Head of the Department  
Department of Cyber Security

## Technical Editors

**Mr. S. Saravanan**

Assistant Professor  
Department of Department of Artificial Intelligence & Data Science

**Mrs. R. Aruna Priya**

Assistant Professor  
Department of Cyber Security



**Shri. A. Srinivasan**

**Esteemed Chancellor**

**Dhanalakshmi Srinivasan University**

## **CHANCELLOR MESSAGE**

I am delighted to know that the department of Computer Science & Engineering, Information Technology, Artificial Intelligence & Data Science, Computer Applications and Cyber Security of Dhanalakshmi Srinivasan Engineering College is hosting the **"International Conference on Smart Intelligent Computing and Applications (ICSICA-2025)**. The event is scheduled to take place on 25<sup>th</sup> April 2025 at Dhanalakshmi Srinivasan Engineering College, 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 **"Smart Intelligent Computing and Applications"** is commendable. The primary objective of this conference is to provide a substantial platform for intellectual exchange. Researchers, industry experts and students can come together to share their findings and insights in the realm of **'Innovative Research'**, 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 **ICSICA-2025**, 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. D. Shanmugasundaram**

**Principal**

Dhanalakshmi Srinivasan

Engineering College

(Autonomous)

Perambalur - 621212

## Message

I am thrilled to learn that the department of Computer Science & Engineering, Information Technology, Artificial Intelligence & Data Science, Computer Applications and Cyber Security of Dhanalakshmi Srinivasan Engineering College, Perambalur, are orchestrating the "**International Conference on Smart Intelligent Computing and Applications (ICSICA-2025)**" on 25<sup>th</sup> April 2025, 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 **ICSICA-2025** 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 **ICSICA-2025** be an outstanding and grand success.



**Dr. K. Anbarasan,**  
**Dean (Academics)**  
Dhanalakshmi Srinivasan  
Engineering College (Autonomous)  
Perambalur - 621212

### **Dean (Academics) Message**

The Global world of Science and Engineering is an electrifying platform with enlarged space for research, design, development and testing on their own diverse innovative regions. The **International Conference on Smart Intelligent Computing and Applications (ICSICA-2025)** on 25.04.2025 will prolong the charm engineers to meet the ideas and solutions for different research challenges of their belonging engineering studies. This happen, by making the young minds to participate constantly in different academic and technical oriented activities regularly for enriching their Innovative ideas in new dimensions. Absolutely, this Conference particularly encourages the Interaction of academicians and student community in comfortable setting to present and discuss their new and current scenario of the research work. I welcome all the delegates to stay engaged, keep themselves proactive in shaping the future technologies. Finally, I'd like to congratulate each of my colleagues for bringing young Innovators to this session-Engineering.



**Dr. M. Chellappan**  
**Controller of Examinations**  
Dhanalakshmi Srinivasan Engineering College  
(Autonomous)  
Perambalur - 621212

## **Controller of Examinations Message**

It gives me massive pleasure and I am overwhelmed with ecstasy to our institution fraternities who have pumped in determination, diligent and scrupulous efforts to bring out this great **International Conference on Smart Intelligent Computing and Applications (ICSICA - 2025)**, to add one more beautiful quill to our cap.

It is inevitable to have such kind of platform now a day to flaunt and explore the hidden technical skills of maturing engineers. I hope that this Conference shall bring a congregation of research students with quest of advancing knowledge skill in recent trends of Engineering and Technology.

I applaud and wish them to make this magnificent and glorious event a grand Success.



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

## **Dean (Research) Message**

As a representative of the organizing committee for the **International Conference on Smart Intelligent Computing and Applications (ICSICA-2025)**, it is with great pride and pleasure that I extend a warm welcome to all participants from esteemed institutions across India and around the world. I am particularly delighted to note that this prestigious event encompasses **five co-located conferences**, all unified under the central theme: "**Integrating Innovations for Shaping a Sustainable Future.**" This thematic focus underscores the conference's commitment to fostering impactful collaboration.

Each conference is marked by the release of a dedicated **Proceedings volume**, which not only commemorates the occasion but also serves as a valuable repository of insights, perspectives, and emerging trends. These contributions are expected to stimulate further research and practical applications across the dynamic domains of **Science, Engineering, and Technology.**

On this significant occasion, I convey my heartfelt greetings to the **Organizing Committee** of each conference and all participants of **ICSICA-2025**. I wish the conference resounding success and hope it becomes a catalyst for meaningful innovation, collaboration, and advancement in global research.

**PREFACE**

We are pleased to present the proceedings of the **International Conference on Smart Intelligent Computing and Applications**, held on 25th April 2025 at Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur, Tamil Nadu. This conference was jointly organized by the Departments of Computer Science & Engineering, Information Technology, Artificial Intelligence & Data Science, Computer Applications and Cyber Security.

The conference theme, “Innovations in Engineering and Technology towards Intelligent Smart Computing reflects the growing need for sustainable solutions and technological advancements in a rapidly changing world. The aim of the conference was to create a platform for researchers, academicians, industry professionals, and students to share their latest research findings, technological developments, and innovative ideas.

This proceedings book includes a selection of peer-reviewed abstracts of research papers that cover a wide range of topics in engineering and technology, showcasing the diversity of research and the spirit of innovation that the event encouraged.

We express our heartfelt gratitude to the authors, reviewers, keynote speakers, session chairs, and all participants whose contributions have made this conference and this publication a success. We also thank the management, faculty, and staff of Dhanalakshmi Srinivasan Engineering College for their support and encouragement throughout the organization of this event.

We hope these proceedings will serve as a valuable resource for researchers and practitioners, and will inspire further exploration and collaboration in the field of sustainable engineering and technological innovation.

**Editorial Committee**

International Conference on Technological Innovations for a Sustainable Future  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur

## International Conference on Smart Intelligent Computing and Applications



Organized by  
**Department of AI&DS, CSE, CST, IT & MCA**  
Date: 25<sup>th</sup> April 2025 | Venue: Central Auditorium



**Theme: Innovating the Future: Harnessing Emerging Technologies for a Smarter, Connected World.** This theme reflects the cutting-edge nature of the technologies listed and their combined potential to shape the future in various fields, from AI to Green Computing. It also emphasizes the interconnectedness of these domains in driving global progress and smart innovations.

### Thrust Areas

- ❖ Deep Learning
- ❖ Machine Learning
- ❖ Artificial Intelligence
- ❖ Block Chain Techniques
- ❖ Internet of Things
- ❖ Green Computing
- ❖ Quantum & Membrane Computing
- ❖ Image Processing Computer vision
- ❖ Speech & Pattern Recognition
- ❖ Big Data Analytics
- ❖ Data Mining
- ❖ Cloud Computing
- ❖ Data Science
- ❖ Neural Network

### Resource Persons

**Dr. Sivaram Murugan**

Faculty of Engineering and Natural Sciences,  
Sivas University of Science and Technology,  
Turkey - 58000

**Dr. G. Lakshmi Sutha,**

Dean - Academics,  
NIT, Puducherry.

**Conference Proceedings:** Accepted abstracts will be included in the Proceedings of “**International Conference on Smart Intelligent Computing and Applications**”. Registration is required for both abstract submission and publication. You can complete the registration via the ‘**Google Form**’ provided below. For further details on abstract submission, please refer to the instructions under the “**Call for Abstracts and Full-Length Research Papers**” section in the conference brochure.

**Journal Publications:** Following a successful peer review process, selected full-length research papers will be published in “**SN Computer Science**” (SCOPUS Indexed). For more details on research paper submission, please refer to the instructions in the “**Call for Abstracts and Full-Length Research Papers**” section of the conference brochure.

**Registration Link:** <https://forms.gle/Kb465mWC2cDaxCxN8>



Scan me

### Organizing Secretaries

**Dr. R. Gopi,** HoD - CSE  
**Dr. V. Thirupathy Kesavan,** HoD - IT  
**Mr. R. Govindasamy,** HoD - MCA  
**Dr. K.V.M. Shree** HoD - AI&DS  
**Mr. D. Vijayakumar,** HoD - CST

### Contact Details

**Mr. V. Gokula Krishnan** (9940332120)  
**Mr. S. Saravana Kumar** (9994017345)  
**Ms. A. Kalpana** (7339286448)  
**Mr. S. Saravanan** (9842254740)  
**Mrs. R. Aruna Priya** (7502916970)

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**



**Dr. R. Gopi**

**HoD - CSE**

Dhanalakshmi Srinivasan Engineering College  
(Autonomous)  
Perambalur - 621212

**VISION AND MISSION OF THE DEPARTMENT**

**VISION**

To produce globally competent, socially responsible professionals in the field of Computer Science and Engineering.

**MISSION**

- M1:** Impart high quality experiential learning to get expertise in modern software Tools
- M2:** Inculcate industry exposure and build inter disciplinary research skills.
- M3:** Mould the students to become Software Professionals, Researchers and Entrepreneurs by providing advanced laboratories.
- M4:** Acquire Innovative skills and promote lifelong learning with a sense of societal and ethical responsibilities

## DEPARTMENT OF INFORMATION TECHNOLOGY



**Dr. V. Thiruppathy Kesavan**

**HoD - IT**

Dhanalakshmi Srinivasan Engineering College

(Autonomous)

Perambalur - 621212

### VISION AND MISSION OF THE DEPARTMENT

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To cultivate ethical and knowledgeable IT professionals, researchers, and entrepreneurs while fostering excellence in Information Technology and related fields

#### MISSION

**M1:** Enhance students' knowledge and computing skills through state-of-the-art infrastructure.

**M2:** Foster academic, employability, and research skills in Information Technology through innovative teaching methods.

**M3:** Motivate and equip students for higher education or entrepreneurial ventures through industry-institute interactions.

**M4:** Cultivate leadership, professional communication skills, and ethical values through dedicated soft skills training for serving society.

**DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA  
SCIENCE**



**Dr. K.V.M. Shree**  
**HOD - AI&DS**  
Dhanalakshmi Srinivasan Engineering College  
(Autonomous)  
Perambalur - 621212

**VISION AND MISSION OF THE DEPARTMENT**

**VISION**

To develop globally competitive professionals in the field of Artificial Intelligence (AI) & Data Science (DS) by imparting cognitive learning of AI&DS tools with basic Computer Science Knowledge and by encouraging Global Industrial collaboration towards serving the greater cause of Engineering Society.

**MISSION**

**M1:** Impart knowledge in cutting edge Artificial Intelligence and Data Science technologies in par with industrial standards

**M2:** Inculcate research and lifelong learning that benefit society at large which promotes ethical values and entrepreneurial skills

## DEPARTMENT OF CYBER SECURITY



**Mr. D. Vijayakumar**

**HoD - CST**

Dhanalakshmi Srinivasan Engineering College  
(Autonomous)  
Perambalur - 621212

### VISION AND MISSION OF THE DEPARTMENT

#### **VISION:**

To promote highly ethical and innovative cyber security professionals through excellence in teaching, training, and research.

#### **MISSION:**

**M1:** To produce globally competent cyber security experts, motivated to learn emerging technologies and Innovate in solving real-world security challenges.

**M2:** To foster research activities among students and faculty that enhances societal security and resilience.

**M3:** To impart moral and ethical values in their profession, ensuring a strong commitment to cyber security ethics and responsible practices.

**DEPARTMENT OF MASTER OF COMPUTER APPLICATION**



**Mr. R. Govindasamy**

**HoD - MCA**

Dhanalakshmi Srinivasan Engineering College

(Autonomous)

Perambalur - 621212

**VISION AND MISSION OF THE DEPARTMENT**

**VISION**

To inculcate in our students, strong values, develop fully integrated personality to face the future with confidence and courage that will uphold through their lives, to be an Institution of excellence in technology education and Research, to provide competent and ethical professional with a concern for society.

**MISSION**

**M1:** To impart quality technical education imbued with proficiency and human values.

**M2:** To provide right ambience and opportunities for the MCA students to make them more efficient, creative, talented and globally competent professionals.

**M3:** To promote research and development in Department of MCA for the benefit of the society.

**International Conference on Smart Intelligent Computing  
and Applications  
(ICSICA-2025)**

**Programme Schedule**

25 <sup>th</sup> , APRIL 2025	
9.30 – 10.30 AM (Central Auditorium)	<b>Inauguration Function</b>
10.30–10.45 AM	Tea Break
<b>Keynote Lecture-I</b>	
10.45 –11.45 AM (Central Auditorium)	<b>Dr. Sivaram Murugan</b> Faculty of Engineering & Natural Sciences, Sivas University of Science and Technology, Turkey-58000
<b>Keynote Lecture-II</b>	
11.45 AM–12.45 PM (Central Auditorium)	<b>Dr. G. Lakshmi Sutha</b> Dean - Academics, NIT, Puducherry
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*ICSICA-2025-001*

## **AI-BASED TRAFFIC MANAGEMENT SYSTEM USING YOLO ALGORITHM**

**Sasikanth.U, Sudharsan.B, Pradeep.K**

K. Ramakrishnan College of Technology, Trichy.

sasikanth15a@gmail.com

### **ABSTRACT**

Traffic congestion is a significant challenge in urban areas, leading to increased travel time, fuel consumption, and environmental pollution. Traditional traffic management systems rely on predefined signal timers or require human intervention, which often fails to adapt to real-time traffic conditions. To overcome these limitations, we propose an AI-driven Traffic Management System that leverages the YOLO (You Only Look Once) algorithm for real-time vehicle detection and dynamic signal control. Our system autonomously detects and counts vehicles at traffic signals using live CCTV footage. By analyzing the number of vehicles in each lane, the AI dynamically adjusts traffic signal timings to optimize the flow of vehicles. This approach enhances road efficiency, reduces congestion, and minimizes idle time at signals. The proposed AI-based traffic management system using the YOLO algorithm provides an intelligent and automated solution to urban traffic congestion. By leveraging real-time image processing and AI-based scheduling, it ensures smooth and adaptive traffic flow, reducing delays and fuel consumption. This cost-effective and scalable solution has the potential to significantly enhance urban mobility and road efficiency.

**Keywords:** AI-based Traffic Management, YOLO Algorithm, Real-time Vehicle Detection, Dynamic Signal Control, Urban Traffic Congestion, Intelligent Transportation System (ITS), CCTV Traffic Monitoring, Image Processing, Adaptive Traffic Signals, Smart City Solutions, Traffic Flow Optimization, Fuel Consumption Reduction, Automated Traffic Control, Computer Vision in Transportation, Real-time Traffic Analysis.

*ICSICA-2025-002*

## **MACHINE LEARNING DRIVEN CYBER INCIDENT DETECTION AND RESPONSE SYSTEM**

**Rahul.R, Samson Jebaseelan.C, Suraj M**

K. Ramakrishnan College of Technology. Trichy.

samsonjebaseelan170@gmail.com

### **ABSTRACT**

This project focuses on evaluating and identifying the best machine learning model for detecting cyber incidents in real time, utilizing five popular algorithms: Random Forest, XGBoost, Decision Tree, Logistic Regression, and LightGBM. The primary goal is to compare these models based on key performance metrics, including accuracy, precision, recall, and F1 score, to determine the most effective approach for detecting cyber threats. Once the best-performing model is selected, it will be deployed to analyze large datasets such as network traffic, system logs, and user behavior to identify potential security incidents. The selected model will then be integrated into an automated response framework, enabling the system to swiftly mitigate detected threats without requiring manual intervention. This approach aims to enhance the accuracy, speed, and efficiency of cyber incident detection and response, providing a more proactive defense mechanism against evolving cybersecurity threats. This study explores the integration of multiple machine learning models—Random Forest, XGBoost, Decision Tree, Logistic Regression, and LightGBM to develop a robust, adaptive system for cyber incident detection and response. By leveraging the strengths of these models, the system can effectively identify anomalous behaviors and potential security threats across large datasets.

**Keywords:** Machine Learning, Cyber Incident Detection, Automated Response, Model Evaluation, Random Forest, XGBoost, Decision Tree, Logistic Regression, LightGBM, Threat Detection, Cybersecurity, Incident Response, Model Performance.

*ICSICA-2025-003*

## **SPEECH SIGN LANGUAGE USING 3D AVATAR**

**S.Arthi**

Assistant Professor, Department of Information Technology  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

**Abinesh, Arumuga Viginesh, Dheena, Somesh**

Department of Information Technology  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

### **ABSTRACT**

This project explores the development of a real-time system that translates spoken language into sign language using a 3D animated avatar. The aim is to bridge the communication gap between hearing and hearing-impaired individuals by offering an accessible and interactive solution. The system captures audio input, processes the speech through natural language processing techniques, and maps the translated content to corresponding sign language gestures. A 3D avatar then performs these signs in real-time, offering a visually engaging and accurate representation of sign language. The use of a 3D avatar enhances understanding by simulating human-like gestures, facial expressions, and body movements, making the communication more natural and intuitive. This innovation has potential applications in education, customer service, public announcements, and more, promoting inclusivity and accessibility for the deaf and hard-of-hearing community.

*ICSICA-2025-004*

## **EUCALYPTUS LEAF DISEASE PREDICTION USING MACHINE LEARNING ALGORITHM**

**Dr. K.R. Baskaran**

Professor,  
Hindusthan College of Engineering and Technology, Coimbatore – 641032.

**R. Jeeva**

Hindusthan College of Engineering and Technology, Coimbatore – 641032.  
jeevar10112002@gmail.com

### **ABSTRACT**

Eucalyptus trees are economically and ecologically significant, but their productivity is threatened by various leaf diseases. Early detection and classification of these diseases can help mitigate their impact and improve plant health. This project proposes an AI-based eucalyptus leaf disease prediction system using the YOLOv5 (You Only Look Once) deep learning algorithm. The model is trained on a dataset of eucalyptus leaf images, where it detects and classifies infected leaves in real time. The YOLOv5 algorithm is chosen for its speed and accuracy in object detection, enabling rapid identification of disease symptoms. The system can be deployed in agricultural fields through a mobile or web-based application, assisting farmers and researchers in monitoring plant health efficiently. The project demonstrates the effectiveness of deep learning in precision agriculture, contributing to the early diagnosis and management of plant diseases.

*ICSICA-2025-005*

## **AI- POWERED LEGAL DOCUMENTATION ASSISTANT**

**Mr. Rajiv Kumar**

Professor,

Hindusthan College of Engineering and Technology, Coimbatore – 641032.

**M. Hariharan**

Hindusthan College of Engineering and Technology, Coimbatore – 641032.

rudra6444401@gmail.com

### **ABSTRACT**

The AI-Powered Legal Documentation Assistant redefines legal drafting by integrating adaptive intelligence, predictive legal analysis, and interactive automation. Unlike conventional tools, it learns from evolving legal trends, dynamically generating legally sound documents customized to specific cases. This AI-driven system proactively detects potential legal loopholes, suggests risk-mitigating clauses, and ensures compliance across multiple jurisdictions. Its contextual understanding refines legal language for clarity while preserving legal precision. Unlike static templates, the assistant constructs intelligent, case-specific documents that adapt to user intent. Integrated with voice-command processing, real-time legal query resolution, and blockchain-backed e-signatures, it enhances both security and efficiency. The system also offers dispute prediction, alerting users to contract vulnerabilities before conflicts arise. By fusing automation with strategic legal insights, this AI assistant transforms documentation into an intelligent, proactive, and risk-aware process, making high-quality legal support accessible to professionals, startups, and individuals without reliance on traditional legal services

*ICSICA-2025-006*

**CYBER THREATS INTELLIGENCE MINING FOR  
PROACTIVE**

**V. Devi**

Assistant Professor,

Hindusthan College of Engineering and Technology, Coimbatore - 641032

**Aarthi V , Deepika KJ, Varsha P, Vanitha J**

Hindusthan College of Engineering and Technology, Coimbatore – 641032

aarthiaarthi9577@gmail.com

**ABSTRACT**

In the face of escalating and intricate cyber-attacks, security systems are struggling to provide adequate protection. The dynamic nature of modern threats demands a new paradigm for cybersecurity. This project focuses on harnessing the potential of Cyber Threat Intelligence (CTI) mining to fortify security measures. By extracting, processing, and analyzing diverse cyber threat data, our project aims to develop an advanced threat intelligence framework. This framework will empower organizations to proactively identify, prevent, and respond to sophisticated cyber threats. Our research reviews recent efforts in CTI mining, proposes a comprehensive taxonomy, and explores current state-of-the-art advancements. The project also highlights challenges and potential future directions in CTI mining, underscoring its vital role in strengthening cybersecurity posture in the modern digital landscape

*ICSICA-2025-007*

## **A SMART VEHICLE PARKING SYSTEM**

**K.Arun Patrick**

Assistant Professor, Department of CSE  
Nehru Institute of Technology, Coimbatore

**Abirami RJ, Kalatheeswaran K, Sherapheena VK, Srivenkatesh R**

Department of CSE  
Nehru Institute of Technology, Coimbatore

### **ABSTRACT**

The proposed project aims to develop a Smart Vehicle Parking System that leverages Artificial Intelligence (AI) and Machine Learning (ML) technologies to optimize parking space utilization, reduce congestion, and enhance user experience. The system will incorporate YOLO (You Only Look Once) and DeepSORT for real-time vehicle detection and tracking, AI-Based Load Balancing using Reinforcement Learning for dynamic parking spot allocation, and XG-Boost for parking demand prediction and optimization. The system will be designed to handle large datasets, provide real-time updates, and ensure efficient parking management in urban environments.

*ICSICA-2025-008*

## **AUTOMATED SCREENING OF CERVICAL SPONDYLOSIS USING DEEP LEARNING AND RADIOGRAPHIC DATA**

**Mr. Sivaganesh H, Mr. Suman R, Mr. Noor Mohamed Halith R**

Department of Information Technology,

IFET College of Engineering, Villupuram.

itsiva25@gmail.com, ramalingam1969rr@gmail.com, kalithkalith606@gmail.com

### **ABSTRACT**

The rising prevalence of Cervical Spondylosis, particularly among younger populations, has increased the demand for X-ray screening. However, diagnostic accuracy is often compromised due to variability in imaging technology, equipment specifications, and the varying experience levels of clinicians. To address these challenges, this study proposes a deep learning-based approach utilizing a ResNet-34 convolutional neural network (CNN). The model was trained on a dataset of 2568 cervical spine X-ray images, encompassing a wide range of projection angles, to ensure robustness across diverse clinical scenarios. Validation was conducted on an independent set of 412 X-ray images, also varied in projection angles, to evaluate the model's generalizability. The proposed model achieved a classification accuracy of 89.7%, significantly outperforming the traditional manual diagnostic approach, which had an accuracy of 68.3%. These results demonstrate the potential of deep learning models to enhance diagnostic accuracy and efficiency in identifying Cervical Spondylosis, offering a promising tool to support clinicians in clinical settings.

*ICSICA-2025-009*

## **AI-POWERED STRUCTURAL CRACK DETECTION FOR BUILDINGS USING YOLO CLASSIFIERS**

**S.R.Saranya, D.Lalitha, V.Manisha, D.Sowndaraya , R.Komala**

Department of Computer Science and Engineering,  
Muthayammal College of Engineering, Rasipuram, Namakkal.

### **ABSTRACT**

Reliability, performance, and life cycle costs are real concerns for almost all in-service massive structures, such as buildings, bridges, nuclear facilities, hydroelectric structures, and dams. Cracks on these structures are a common phenomenon associated with various internal and external forces, including the corrosion of embedded reinforcement, chemical deterioration of concrete, and the application of adverse loading to the structure. In comparison to the traditional manual inspection-based crack detection system, computer vision and machine learning-based approaches are quickly becoming an integral part of the modern segmentation of civil infrastructures to automate crack detection and identification systems. This paper is about the construction and application of a device that uses image processing to detect cracks. The system is carried by a drone and can be remotely accessed. The system has a graphical user interface for initializing the device, viewing real time image, taking pictures of a crack, measuring its width, and evaluating if safe or unsafe. The pictures and their results are stored for reference. And implement contrast enhancement to improve the contrast of the image and using binarization techniques to provide binary image. Finally implement the segmentation using YOLO (you look only once) algorithm to segment the image to detect the crack with improved accuracy.

**Keywords:** Cracks detection, Machine learning, Deep learning, Neural networks, Deep convolutional neural network.

*ICSICA-2025-010*

**SAFETY ALERT SYSTEM IN CONSTRUCTION: A PPE VIOLATION  
DETECTION APPROACH USING AI**

**T. Dhivya**

Assistant Professor, Department of Computer Science and Engineering  
Meenakshi Sundararajan Engineering College, Chennai.  
dhivyathirugnanam@msec.edu.in

**C. S. Karthik, S. Tharunrajan, A. Karthickkumaran**

Department of Computer Science and Engineering  
Meenakshi Sundararajan Engineering College, Chennai.

**ABSTRACT**

Construction sites pose significant safety risks, and compliance with Personal Protective Equipment (PPE) regulations is crucial to preventing accidents. This paper presents an AI-driven Safety Alert System for Construction Sites, utilizing YOLOv11-M models to detect PPE violations in real-time from CCTV footage, webcam feeds, and uploaded videos. The system integrates a Flask-based web application with video processing capabilities and automated email alerts/SMS to notify safety officers of violations. Experimental results demonstrate high accuracy in detecting safety shoes, edge barriers, construction equipment, and power lines, making the system a reliable tool for enhancing workplace safety.

*ICSICA-2025-011*

## **HABIT TRACKER FOR STUDENTS**

**D. Gaythri**

Assistant Professor, Department of Information Technology,  
Meenakshi Sundararajan Engineering College, Chennai.  
dgayathri@msec.edu.in

**Priyadharshini V, Tanujhaa G**

Department of Information Technology,  
Meenakshi Sundararajan Engineering College, Chennai.

### **ABSTRACT**

The Habit Monitoring system is a holistic platform intended to support students in monitoring and enhancing their daily routines and habits and ensuring overall well-being. By implementing a user authentication mechanism, the platform provides secure access to tailored content. When users register, they are asked to input key health details such as their BMI, age, and fitness stats. The information is used to customize a personalized daily routine that matches their level of fitness and general health. The system's central functionality is based on a structured and personalized schedule, which prompts students to participate in a range of activities, from exercise to wellness routines. As users finish tasks described in their schedules, they receive reward points, offering an intrinsic motivation to remain dedicated to their objectives. The reward system is intended to create a feeling of accomplishment and responsibility, making healthy decisions more enjoyable and quantifiable. The system is not just tracking progress but also adaptability. The platform utilizes the user's health profile to provide tailored recommendations, making sure the suggested activities are relevant to their specific fitness requirements and objectives. This strategy increases the level of user engagement by providing content that appears relevant and within their reach. Some of the major advantages of the Habit Monitoring system are improved user interaction in the form of organized, responsible programs, motivation through reward points, and user-specific recommendations from users' health information.

*ICSICA-2025-012*

## **MENTAL DISORDER CLASSIFICATION USING RNN MODEL**

**Mohan Raj Vijayan**

Professor, Department of Information Technology,  
Meenakshi Sundararajan Engineering College, Chennai.  
mohanrajvijayan@msec.edu.in

**Manojkumar Parthasarathy**

Department of Information Technology,  
Meenakshi Sundararajan Engineering College, Chennai.  
manojkumarparthasarthy@gmail.com

### **ABSTRACT**

In recent years, the issue of mental health has gained ground as a threat to the global population's wellbeing creating a need for appropriate tools for diagnosis to facilitate early intervention and treatment. The project investigates classifying mental disorders using Recurrent Neural Networks (RNN) based on different types of text data including patient notes, social media comments, and psychological evaluations. RNNs are neural networks that process data sequentially making them useful in understanding text where context is key in understanding some symptoms of mental health. The work also includes pre-processing textual inputs, feature extraction, and training an RNN model to classify disorders which are within, but not limited to depression, anxiety, and bipolar disorder. The dataset is made out of incidentally available mental health data and is well edited to remove unfit material. The performance of the RNN Model is then measured in terms of ratio of correctly computed values to the total number of cases, and other metrics, such as precision, recall, and F1 score, are employed. The results demonstrate that the accuracy of the RNN-based insanity classifier is very high, which means that this tool has great significance for assisting mental health professionals.

**Index Terms:** Mental Health Classification, Recurrent Neural Networks (RNN), Text Data Analysis, Depression Detection, Anxiety Prediction, Bipolar Disorder, Machine Learning in Healthcare

*ICSICA-2025-013*

## **ADVANCED PLANT IRRIGATION SYSTEM USING IOT**

**M.Rajavel, R.Periyasamy, S.Saravanan**

K. Ramakrishnan College of Technology, Trichy

rajavelmurgan7209@gmail.com

### **ABSTRACT**

In the modern era of agriculture and horticulture, plant monitoring has become a critical necessity to ensure healthy plant growth and maximize crop yield. Traditional methods of plant care are often labor-intensive and time-consuming, which makes them unsuitable for large-scale farming or even urban gardening. With the advent of Internet of Things (IoT) and ambient intelligent systems, there is an increasing shift towards automation and smart monitoring in agriculture. Technologies such as Smart Homes [1] and RFID-based systems [2] have already proven their efficiency in intelligent environments, and their integration with agriculture offers a promising future. This project introduces an Advanced Plant Irrigation System using IoT, leveraging ambient intelligence to automate and optimize plant care. The system is built using the .NET Gadgeteer platform, which provides modular and rapid prototyping capabilities. It includes a variety of sensors to continuously monitor vital environmental parameters such as soil moisture, ambient temperature, and light intensity. These sensor readings are processed and interpreted by a microcontroller, which then makes intelligent decisions such as turning on irrigation when the soil is dry or switching on artificial lights in low-light conditions. Furthermore, the system is integrated with a cloud-based server, which acts as a central data hub for storing sensor data and enabling remote monitoring. Users can access this information through a dedicated mobile application on Android or iOS devices.

*ICSICA-2025-014*

## **AI POWERED HAND GESTURE RECOGNITION FOR TOUCHLESS DESKTOP CONTROL**

**A.Sumathi**

Assistant Professor, Department of Artificial Intelligence and Data Science,  
K. Ramakrishnan College of Technology. Trichy

**Kokila Priya S, Sathashini S, Sibia Pauline J, Sneha K**

Department of Artificial Intelligence and Data Science,  
K. Ramakrishnan College of Technology. Trichy

### **ABSTRACT**

The Real-Time Hand Gesture Recognition System for Desktop Control enables touch-free human-computer interaction by leveraging advanced computer vision and machine learning. It utilizes MediaPipe for accurate hand landmark detection, TensorFlow/Keras for classifying gestures using a trained deep learning model, and PyAutoGUI to map gestures to desktop actions like mouse clicks, keyboard shortcuts, and media control. The system captures hand movements via webcam and processes real-time video to recognize gestures instantly. The project includes dataset creation, model training, and real-time implementation, making it a complete solution for gesture-based control. It enhances accessibility, reduces dependence on physical input devices, and supports use cases in gaming, accessibility tools, and contactless control. This AI-powered interface allows users to navigate and control their desktop in a natural, intuitive manner, demonstrating the potential of intelligent systems in everyday computing.

*ICSICA-2025-015*

## **FACILITATING BUILDING MAINTENANCE THROUGH DEEP LEARNING - BASED DEFECT DETECTION**

**M.A. Prasanna**

Assistant Professor, Department of Computer Science and Engineering,  
K. Ramakrishnan College of Technology, Trichy.  
mapsan1984@gmail.com

**Abarna G, Indira M, Keerthana N, Linu Upasi A**

Department of Computer Science and Engineering,  
K. Ramakrishnan College of Technology. Trichy.

### **ABSTRACT**

Crack detection in buildings and other civil infrastructures is essential to ensure their structural integrity, safety, and longevity. Traditional manual inspection methods are labor-intensive, time-consuming, and prone to human error. With advancements in Artificial Intelligence (AI), particularly in Deep Learning (DL), automation in structural monitoring has gained momentum. This project proposes a Deep Learning-based Crack Detection System utilizing the YOLO (You Only Look Once) algorithm for real-time and accurate identification of structural defects. The system harnesses image processing and object detection capabilities to effectively monitor and analyze building conditions. It comprises key modules including image acquisition, preprocessing, model building, camera integration, and defect detection. Structural images are captured and preprocessed using techniques such as grayscale conversion, noise reduction, and feature extraction. These processed inputs are fed into a YOLO-based deep learning model trained using publicly available datasets like SDNET2018 and Crack500. The trained model detects and classifies cracks in real-time, presenting results visually through bounding boxes. A user-friendly graphical interface enhances accessibility, enabling real-time monitoring and remote analysis via connected devices. This intelligent approach not only accelerates the maintenance process but also increases accuracy, reduces renovation costs, and supports proactive infrastructure care.

*ICSICA-2025-016*

## **PHISHING DETECTION BY MACHINE LEARNING**

**T.R.Priyadhrshini**

Assistant Professor, Department of CSE,  
Nehru Institute of Technology, Coimbatore

**Akash K, Akash N, Prakash R, Senthil Kumar K S**

Department of CSE,  
Nehru Institute of Technology, Coimbatore

### **ABSTRACT**

Phishing is a widespread cyber threat that deceives users into revealing sensitive information such as passwords, credit card numbers, and personal details. This project titled "Phishing Detection by Machine Learning", presents an intelligent solution to detect phishing websites using machine learning techniques. By analyzing various features of URLs such as structure, domain details, and website behavior the system is able to distinguish between legitimate and malicious links. A web-based interface allows users to input a URL, which is then processed and classified as either safe or potentially harmful. The goal of this project is to enhance user awareness and provide an effective tool for identifying phishing attempts, thereby contributing to improved online security.

*ICSICA-2025-017*

## **PARKINSONS DISEASE DETECTOR**

**Dr. G. Rajiv Suresh Kumar**

Professor, Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

**Kiran M, Sathaiah M, Balaji R, George Nelson M**

Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

### **ABSTRACT**

The main objective of our project is to find a best machine learning model that can be used for early prediction of Parkinson's disease using the motor symptoms. This would in turn help the people to get the necessary treatments that we talked previously for easing the symptoms before the disease gets even worse. Because, if the disease becomes extremely severe, no matter what medications you use for the symptoms, it would be having no effect on it. Hence, this machine learning model could be used for early detection of the disease which would help to increase the lifespan of elderly person with Parkinson. This would help to decrease the deaths caused by Parkinson's disease.

*ICSICA-2025-018*

## COMPUTATIONAL QUANTUM MECHANICS FOR ADVANCING DRUG DEVELOPMENT AND PERSONALIZED MEDICINE

**John De Britto C**

Assistant Professor, Department of EEE,  
Saveetha Engineering College, Chennai- 602 105.  
yjohnde@gmail.com

### **ABSTRACT**

Quantum mechanics can provide the capability of quantum computers to revolutionize healthcare in drug discovery, diagnostics, and treatment tailoring. This paper provides a thrilling vision for this new front. Key applications made possible by quantum computing relate to: Design of novel drugs: Simulation of complex molecular interactions enables a quantum computer to accelerate the process of finding effective drugs with reduced side effects. Improved diagnostics: Quantum machine learning algorithms can diagnose medical images with better accuracy, helping to make diagnoses at an early and accurate stage. Personalized treatment: Quantum computation is able to forecast a patient's response to a treatment clustered under an existing therapy scheme. Improved radiation therapy: Individual patients can receive quantum simulations with the most effective and least harmful radiation therapy. However, it is a field that is in the beginning stages of its evolution. The challenges are as Quantum computers today have limited capability, and there is much future work to be done before they reach their full potential. Security: Quantum computers are extremely powerful, so there's fear that, with today's techniques for encryption, the security of electronic health records would be compromised. It provides an overall picture of quantum computing in medicine, highlighting technology, potential applications, security issues, and future research directions.

**Keywords:** Quantum Computing, Drugs Recovery Mode, Electronic Health Record (EHR), Quantum Approximate Optimization Algorithm(QAOA) , Image Testing .

*ICSICA-2025-019*

## **DYNAMIC FULL STACK JOB HUNTING AND HIRING PLATFORM**

**Dr. M. Ganesan**

Associate Professor, Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

**Askika R, Ragul M, Riyaz M S, Sowndharya S**

Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

### **ABSTRACT**

This project presents a comprehensive full stack job finder Android application designed specifically for students studying away from their hometowns who are seeking part-time job opportunities. Developed using Android Studio as the native Integrated Development Environment (IDE), the application utilizes XML for frontend design and Java for backend development. The Firebase platform is employed as the database solution to ensure efficient and scalable data management. The application provides an intuitive user interface that allows students to easily search for available part-time jobs in their vicinity, leveraging location services for personalized job recommendations. The location service implementation ensures that job listings are filtered based on the user's current location, enhancing the relevancy and convenience of job searches.

*ICSICA-2025-020*

## **CLOUD-ENABLED IOT SYSTEM FOR MONITORING WATER CONTAMINATION AND HEAVY METAL LEVELS**

**S. Arthi**

Assistant Professor, Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore – 641032

**Muthu kalishwaran R, Rathish B, Saravana kumar E**

Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

### **ABSTRACT**

The rapid growth of retail markets and increasing customer expectations have created a demand for smarter, faster, and more efficient shopping experiences. Traditional billing systems in supermarkets often result in long queues, manual errors, and inefficient inventory handling. To address these challenges, this project presents an IoT-based Smart Trolley System that automates billing and enhances customer convenience through real-time tracking and data synchronization. The proposed system utilizes RFID (Radio Frequency Identification) technology and a Node MCU microcontroller to identify products and manage the billing process. Each product in the store is tagged with an RFID tag, and the trolley is equipped with an RFID reader, OLED display, and Wi-Fi-enabled Node MCU. As a customer adds an item to the trolley, the RFID reader detects the product tag and sends the data to the Node MCU. The microcontroller fetches product details such as name and price from the Firebase real-time database and displays them on the OLED screen. This enables customers to monitor their total bill dynamically as they shop. If an item is removed, the system updates the bill instantly, ensuring billing accuracy.

*ICSICA-2025-021*

## **IMAGE FORGERY DETECTION USING CONVOLUTIONAL NEURAL NETWORK**

**Dr. M. Sabrigiriraj**

Professor and Head, Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

**Rohini R, Sri Renugadevi B, Vasanth G, Yuvarani J**

Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

### **ABSTRACT**

With the increasing use of digital images and editing tools, image forgery has become a serious concern across various fields, including media, forensics, and security. The second phase of this Python-based Image Forgery Detection project builds on earlier work to create a more advanced and accessible solution for identifying tampered images. The system focuses on detecting two main types of forgeries: copy-move forgery, where part of an image is duplicated within the same image, and splicing, where content from multiple images is combined. These types of manipulation are hard to detect with the naked eye, making automated detection crucial. This phase combines traditional image processing techniques with deep learning for improved accuracy. ORB (Oriented FAST and Rotated BRIEF) is used for efficient feature extraction, followed by block and key point matching to identify duplicated regions. In addition, a Convolutional Neural Network (CNN) is introduced to detect deeper inconsistencies such as texture or lighting mismatches that may signal tampering. The system is tested on well-known datasets like CASIA and CoMoFoD, with metrics such as accuracy, precision, and recall showing improved results over the previous phase. A key addition in Phase II is a Graphical User Interface (GUI) developed with Tkinter, allowing users to upload images, analyse them, and view the results without needing to interact with the code.

*ICSICA-2025-022*

## **FAKE REVIEWS DETECTION USING MACHINE LEARNING AND DEEP LEARNING ALGORITHMS**

**S. Karthik**

Assistant Professor, Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

**Jayashri Hamalatha G, Prakash Raj R, Ramkumar S, Vikram G.**

Hindusthan College of Engineering and Technology, Coimbatore - 641032

### **ABSTRACT**

In the modern digital era, counterfeit reviews are a critical issue because they are generally used to manipulate users, influence opinions, and make money. Fake reviews have the ability to manipulate consumer perception, affect business reputation, and destroy user trust. Our project addresses this problem by detecting fake reviews using deep learning methods with TensorFlow. We used the Fake Reviews News Dataset, which includes labeled real and fake reviews, examining both the review headline and the body for better context understanding. Different classification models like K-Nearest Neighbors (KNN), Support Vector Machine (SVM), Convolutional Neural Networks (CNN), and Neural Networks (NN) were used to increase the accuracy of detection. This is particularly vital for media websites that rely on genuine content in order to continue reader trust and ad revenue. With fake reviews usually written by humans or robots growing exponentially across social networks, real-time automatic detection tools are now necessary in order to sustain information integrity within society.

ICSICA-2025-023

## DERMATOLOGICAL DISEASE DETECTION WITH ML BASED IMAGE ANALYSIS

**H. Anjalin Sneha**

Assistant Professor, Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

**Mydeen M, Sethuraman UL, Thanush Kumar M, Venkatesh S.**

Hindusthan College of Engineering and Technology, Coimbatore - 641032

### ABSTRACT

Skin conditions account for a large share of global health problems, impacting millions of people globally. For effective therapy to be administered and problems to be avoided, early and precise diagnosis is essential. In light of clinical and imaging data, this work investigates the use of machine learning algorithms for the prediction of dermatological illnesses. With certain models exhibiting great accuracy in identifying particular skin problems, the results point to the promise of machine learning in the prediction of dermatological diseases. The created models can help medical practitioners make better decisions, which will result in prompt and precise diagnosis. The ultimate objective of illness prediction is to equip people and healthcare professionals with the information and resources they need to take preventative action, make wise decisions, and eventually enhance general health and wellbeing. Utilizing Convolutional Neural Networks (CNNs) to improve dermatological image processing is a major part of our study. CNNs have proven to be remarkably effective at classifying images, especially in the field of medical imaging. In this work, we employ CNNs to automatically learn hierarchical feature representations from dermatological photos, identifying complex patterns and textures that might be suggestive of particular skin disorders.

**Keywords:** CNN, Machine Learning.

*ICSICA-2025-024*

**SMART INTELLIGENT COMPUTING: ENABLING TECHNOLOGIES,  
APPLICATIONS AND FUTURE TRENDS –A SURVEY**

**Dr. K. Adlin Suji**

Assistant Professor, Department of Computer Applications

Bishop Heber College (Autonomous), Trichy

adlinsuji.ca@bhc.edu.in

**ABSTRACT**

Smart Intelligent Computing (SIC) represents a rapidly evolving interdisciplinary paradigm that integrates core technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), big data analytics, and real-time processing to enable systems that are autonomous, adaptive, and context-aware. These systems are designed to analyze vast volumes of real-time data, learn from patterns, and make intelligent decisions with minimal human intervention. As digital transformation accelerates across industries, SIC plays a pivotal role in reshaping domains including healthcare, transportation, energy, manufacturing, and smart urban infrastructure. This paper offers a comprehensive overview of the technological foundations underpinning SIC, focusing on advanced deep learning algorithms, edge-cloud computing architectures, predictive modelling techniques, and the integration of IoT networks. The synergy among these technologies allows for the development of intelligent ecosystems that are responsive, scalable, and efficient. In addition to technological enablers, the paper explores a wide range of real-world applications, illustrating how SIC enhances operational efficiency, optimizes decision-making, and fosters sustainability. Examples include AI-driven healthcare diagnostics, smart traffic and logistics systems, energy-efficient smart grids, and personalized cloud services. The study also presents an in-depth analysis of the architectural layers that constitute the SIC ecosystem, highlighting data flow from sensing devices to user interaction. Despite its transformative potential, SIC faces several challenges.

**Keywords:** Smart Intelligent Computing; Artificial Intelligence; Machine Learning; Internet of Things; Real-Time Analytics; Edge Computing; Green Sustainability; Cybersecurity; Ethical AI; Intelligent Systems

*ICSICA-2025-025*

## **IDENTIFYING SIGN LANGUAGE AND CONVERTING IT INTO TEXT USING DEEP LEARNING**

**P. Karthika**

Assistant Professor, Department of CSE,  
K. Ramakrishnan College of Technology (Autonomous), Trichy.

**Hemvarsini, Keerthana S, Keerthika K , Kiruthika I**

Department of CSE,  
K. Ramakrishnan College of Technology (Autonomous), Trichy.  
hemvarsinimanikandan@gmail.com

### **ABSTRACT**

This research presents an intelligent system utilizing deep learning techniques to translate sign language gestures into text. The primary objective is to facilitate communication for individuals with hearing and speech impairments, offering a reliable and accessible solution. The system employs Convolutional Neural Networks (CNNs) to achieve real-time recognition with high accuracy while ensuring hardware independence and cost efficiency. Advanced preprocessing techniques, including noise reduction, normalization, and image resizing, enhance robustness in diverse environments. Augmentation methods such as flipping, rotation, and brightness adjustments improve the model's adaptability to multiple sign languages. Optimized deep learning architectures ensure minimal latency in generating text outputs, enhancing real-time performance. A key feature of the system is its scalability, allowing for adaptation to various regional and international sign languages through dataset expansion and retraining. Future enhancements will integrate text-to-speech functionality to provide spoken outputs, broadening its usability. The system's cost-effectiveness ensures accessibility, making it a valuable advancement in assistive technology. This research ultimately aims to foster inclusivity, improving communication for individuals relying on sign language.

**Keywords:** Sign Language Recognition, Deep Learning, Convolutional Neural Networks, Assistive Technology, Real-Time Translation

*ICSICA-2025-026*

**CYBERSECURITY FOR ADVANCED MEDICAL DEVICES WITH  
ENHANCED FUNCTIONALITY**

**Dr. M. Ganesan**

Associate Professor, Department of Information Technology  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

**Bharathkumar K, Muthukumaran R, Praveen S, Thirumal S**

Department of Information Technology  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

**ABSTRACT**

Pace CAP v1.0 is an AI-powered cybersecurity layer designed to protect pacemakers from cyber threats. As pacemakers become more connected via wireless technologies, they face increasing risks of unauthorized access and malicious interference. PaceCAP uses advanced machine learning, anomaly detection, and real-time analytics to monitor pacemaker behavior and detect suspicious activity. It offers secure Bluetooth connectivity and remote monitoring, reducing the need for frequent hospital visits. Through a user-friendly interface, it enables seamless data sharing between patients and healthcare providers, enhancing both safety and convenience. This innovation aims to improve the security, reliability, and usability of implantable cardiac devices for better patient outcomes.

*ICSICA-2025-027*

## **ROAD LANE DETECTION USING OPENCV AND MOVIEPY**

**R. Praveen Kumar**

Professor, Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore – 641032.

**Suba Sri K, Safika Banu M**

Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore – 641032.

### **ABSTRACT**

In recent years, the development of autonomous vehicles and advanced driver-assistance systems (ADAS) has gained significant momentum. A crucial component of these intelligent systems is the ability to detect and follow road lane markings accurately. Lane detection plays a pivotal role in maintaining vehicle position, executing lane changes, and enhancing overall driving safety. Traditional lane detection systems often rely on specialized hardware and costly sensors; however, computer vision offers a cost-effective alternative by using standard cameras and image processing algorithms. This project focuses on implementing a lane detection pipeline using two powerful Python libraries: OpenCV and MoviePy. OpenCV provides the tools for image analysis and processing, while MoviePy simplifies the handling of video files, frame manipulation, and real-time visualization. Together, they form an efficient and lightweight framework capable of detecting straight lane lines in road video footage.

*ICSICA-2025-028*

## **AI-POWERED VIRTUAL JOB INTERVIEW SIMULATOR**

**K. Vallipriyadharshini**

Assistant Professor, Department of CSE,  
K. Ramakrishnan College of Technology (Autonomous), Trichy.

**Bavithran K, Janarthanan S, Kavin V, Killivalavan M**

Assistant Professor, Department of CSE,  
K. Ramakrishnan College of Technology (Autonomous), Trichy.

bavirosi@gmail.com

### **ABSTRACT**

In today's competitive job market, effective interview preparation is essential for candidates seeking employment. Traditional methods often lack interactivity and personalized feedback, leaving job seekers unprepared. To address this, we propose the AI-Powered Virtual Job Interview Simulator, an innovative application utilizing Natural Language Processing (NLP) for comprehensive interview training. The simulator provides a realistic and interactive environment, allowing users to practice role-specific interviews. It features an extensive question bank, ensuring simulations tailored to various professional positions. Upon selecting a role, candidates receive structured questions that mirror real-world interview scenarios, fostering immersive learning. A key feature is its real-time response analysis using NLP techniques, including sentiment analysis, coherence checks, and relevance assessments. This feedback mechanism helps users identify strengths and areas for improvement, refining their communication skills. Developed using the Flask web framework, the simulator ensures a user-friendly experience for individuals at all technical levels. Additionally, machine learning algorithms enhance adaptability by learning from user responses, providing increasingly personalized feedback.

**Keywords:** AI-Powered Virtual Job Interview Simulator, Interview Preparation, Natural Language Processing (NLP), Real-time Response Analysis, Sentiment Analysis, Machine Learning Algorithms, Personalized, Feedback, Career Development

*ICSICA-2025-029*

**A SMART SUPPORT SYSTEM FOR FEARLESS STEPS VISION STICK  
USING ARTIFICIAL INTELLIGENCE (AI) / COMPUTER VISION**

**T. Dhivya**

Assistant Professor, Department of CSE  
Meenakshi Sundararajan Engineering College, Chennai.  
dhivyathirugnanam@msec.edu.in.

**D. Dhanush, U. Pavan Kumar, A.J Md Jaffer Siddique**

Department of Artificial Intelligence and Data Science,  
Meenakshi Sundararajan Engineering College, Chennai.

**ABSTRACT**

Moving through everyday spaces safely and confidently depends largely on one's ability to observe and interpret their surroundings. For individuals without visual input, this becomes a constant challenge, particularly in unfamiliar or crowded environments. Traditional walking sticks provide basic physical feedback but lack the ability to convey information about objects beyond immediate contact, limiting spatial awareness and reducing the user's confidence and independence. To address this issue, this project introduces a smart walking stick that integrates artificial intelligence and voice interaction to assist users in understanding their environment more effectively. The system captures visual data through a camera, processes it using machine learning techniques to detect and identify objects, and communicates relevant information through voice output. This enables users to perceive their surroundings audibly and navigate without needing to physically interact with obstacles. Additionally, the device supports voice commands, offering a hands-free, user-friendly experience. By combining real-time object detection, computer vision, and speech technologies into a compact and accessible tool, the smart walking stick aims to improve the safety, mobility, and autonomy of visually impaired individuals, offering a more intelligent and supportive approach to assistive navigation.

*ICSICA-2025-030*

## **EFFICIENT PREDICTION OF LENGTH OF STAY UTILIZING EXPLAINABLE DEEP LEARNING MODELS**

**Mohan Raj Vijayan**

Assistant Professor, Department of Information Technology  
Meenakshi Sundararajan Engineering College, Chennai.  
mohanrajvijayan@msec.edu.in.

**Ramya B, Sharmila R**

Department of Information Technology,  
Meenakshi Sundararajan Engineering College, Chennai.

### **ABSTRACT**

Accurate estimation of hospital Length of Stay (LOS) is of utmost significance in order to optimize healthcare procedures, utilize resources in the best possible way, and enhance patient outcomes. Regular machine learning methodologies such as Random Forest, SVM, and XGBoost have good predicting precision but cannot explain why the prediction has been made and can become incompetent in handling high-dimensional and time-series data. This work proposes a deep learning methodology using Feedforward Neural Networks (FNN), Long Short-Term Memory (LSTM), and Recurrent Neural Networks (RNN) to improve LOS prediction accuracy. Among them, LSTM yielded the highest precision with an accuracy of 0.98, making it highly effective for modeling sequential data. To resolve interpretability challenges, the system incorporates Explainable AI (XAI) using Local Interpretable Model-Agnostic Explanations (LIME), providing clinicians with transparent and actionable insights. The system is modular and scalable, supporting the integration of preprocessing, feature engineering, training, and visualization modules. With future enhancements including real-time data integration and broader clinical applicability, the solution addresses key limitations of traditional models and stands as a robust clinical decision-making tool.

*ICSICA-2025-031*

**AUTOMATED CONTENT DISPLAY SYSTEM FOR  
DIFFERENTLY ABLED**

**Aarthi. M ,Divya Dharshini. M,Vidhya Premanand**

Department of CSE,  
Meenakshi Sundararajan Engineering College, Chennai,  
0808aarthi2003@gmail.com

**ABSTRACT**

This project presents an intelligent, inclusive educational support system that leverages computer vision and AI to assist both normal individuals and those with hearing and speech impairments (deaf and mute). The system begins with a computer vision-based user input method, where the individual selects between two options for Normal users Utilizes the Web Speech API to transcribe spoken input into text. The transcribed word is analyzed to determine if it's a grammar-related word (e.g., adverb, conjunction, etc.) and for Deaf and mute users Uses computer vision to recognize sign language gestures and convert them into text. The interpreted word is then analyzed to check if it's a grammar word.

*ICSICA-2025-032*

## **IMAGE FORENSICS USING COMPUTER VISION**

**T. Dhivya**

Assistant Professor, Department of CSE,  
Meenakshi Sundarajan Engineering College, Chennai,  
dhivyathirugnanam@msec.edu.in

**Ramya.N, Nivetha. S**

Department of Artificial Intelligence and Data Science,  
Meenakshi Sundarajan Engineering College, Chennai,  
ramyaaa876@gmail.com,sureshnivetha281@gmail.com.

### **ABSTRACT**

Image forensics plays a crucial role in detecting manipulated images, particularly with the rise of deepfakes and adversarial modifications. This paper presents a computer vision-based approach integrating Convolutional neural networks (CNNs) and transformer models for enhanced forgery detection. We analyze spatial and frequency domain features across real and synthetic datasets to improve accuracy and generalization. Data preprocessing, augmentation, and adversarial training techniques are employed to enhance robustness. Our approach effectively mitigates challenges such as dataset biases and overfitting. Experimental results demonstrate high detection accuracy, making this method a valuable tool for digital forensic investigations and media authentication.

*ICSICA-2025-033*

## ROAD SIGN DETECTION USING MACHINE LEARNING IN CNN

**Mohammed Thoufik.U, Sundaramanickam.N, Thamij Ahamed.M,**  
K. Ramakrishnan College of Technology, Trichy.  
mohamedthoufik477@gmail.com

### **ABSTRACT**

Road sign detection is a crucial component of intelligent transportation systems, designed to enhance road safety and navigation. The ability to automatically detect and classify road signs in real time can significantly aid drivers and autonomous vehicles in making timely and informed decisions. This research focuses on leveraging machine learning and computer vision techniques to develop an efficient road sign detection system. By analyzing images captured from vehicle-mounted cameras, the system can recognize sign shapes, colors, and symbols, enabling swift responses to road conditions. A major challenge in road sign detection is ensuring high accuracy across diverse environmental conditions, including varying lighting, weather, and occlusions. Traditional detection methods often struggle in complex scenarios, leading to reduced recognition rates. To address this, we employ deep learning models, particularly Convolutional Neural Networks (CNNs), which have demonstrated superior performance in feature extraction and classification. The dataset used in this study consists of real-world road sign images with varying backgrounds and illumination levels to enhance model robustness. The system is trained using a combination of supervised learning techniques and transfer learning to improve efficiency. The experimental results indicate that our model achieves high accuracy in detecting and classifying road signs, even under challenging conditions. Compared to conventional machine learning approaches, deep learning-based models offer better generalization and adaptability.

**Keywords:** Road Sign Detection, Machine Learning, Deep Learning, Intelligent Transportation, Autonomous Vehicles.

*ICSICA-2025-034*

## **A NOVEL DEEP LEARNING FRAMEWORK FOR REAL-TIME VEHICLE DETECTION AND FEATURE EXTRACTION FROM VIDEO DATA**

**Mrs. Sathya,**

Department of Artificial Intelligence and Data Science,  
Meenakshi Sundararajan Engineering college, Chennai.

**Surya K S, Santhosh M, Santhosh R,**

Department of Artificial Intelligence and Data Science,  
Meenakshi Sundararajan Engineering college, Chennai.

### **ABSTRACT**

A novel framework for vehicle detection and feature extraction from video data is introduced, utilizing advanced deep learning models. The proposed system integrates YOLOv8, a state-of-the-art object detection algorithm, for accurately identifying and classifying various types of vehicles, including cars, buses, trucks, and motorbikes, in real time. YOLOv8's ability to detect multiple classes of objects with high precision makes it ideal for complex traffic scenarios where diverse vehicle types need to be recognized simultaneously. To enhance the system's analytical capabilities, ResNet-50 and EfficientNet-B0 are employed for high-level feature extraction, enabling the capture of intricate details about each detected vehicle, such as size, shape, and other distinguishing characteristics. The effectiveness of the framework is evaluated using key performance metrics, including precision, recall, F1-score, and accuracy, calculated at regular intervals to ensure reliable and accurate outputs across different traffic conditions and environments. Designed to operate in real time, the system supports a range of practical applications, including traffic monitoring, vehicle counting, and smart city initiatives, providing visual feedback by marking detected vehicles directly on video frames. The integration of these cutting-edge models creates a versatile solution that can aid in intelligent traffic management, enhance vehicle tracking, and support autonomous driving technologies.

*ICSICA-2025-035*

## **FACEBOOK & INSTAGRAM ADS: MAXIMIZING ROI WITH TARGETED CAMPAIGN**

**Vishwa P, Sasidaran K, Velmurugan S**

K.Ramakrishnan College of Technology,Trichy.

vishwavishwavv90256@gmail.com

### **ABSTRACT**

In the ever-evolving landscape of digital marketing, Facebook and Instagram ads offer businesses the opportunity to precisely target and engage with potential customers, resulting in optimized returns on investment (ROI). To maximize the effectiveness of these campaigns, it's crucial to design strategies that align with specific business goals, such as brand awareness, lead generation, or sales conversion. An effective ad campaign begins with robust audience segmentation. By utilizing Facebook and Instagram's powerful targeting tools, businesses can tailor their ads based on a variety of factors, including demographics (age, gender, income), interests (hobbies, activities), behaviors (purchase history, device usage), and geographic location. This approach ensures that the right messages reach the most relevant audiences, driving higher engagement and conversion rates. Moreover, leveraging AI and machine learning algorithms within the platforms allows advertisers to continually refine their audience targeting. By analyzing past campaign data, these advanced technologies can identify patterns and optimize future ad delivery for better performance, ensuring that marketing budgets are spent efficiently. With continuous data-driven adjustments, Facebook and Instagram ads become an even more powerful tool in driving business growth and achieving measurable success across diverse objectives. In summary, maximizing ROI on Facebook and Instagram ads requires an integrated approach that combines audience segmentation, tailored campaign goals, and the smart use of AI to refine and improve targeting strategies over time. This combination empowers businesses to reach their desired outcomes more effectively while enhancing customer engagement and brand presence.

*CSICA-2025-036*

## VITAMIN DEFICIENCY DETECTION USING IMAGE PROCESSING AND NEURAL NETWORK

**M.Arunkumar**

Assistant Professor, Department of Information Technology,  
IFET College of Engineering, Villupuram,  
arunkumaran0705@gmail.com

**K.Vishwa, R.Gurunathan,**

Department of Information Technology,  
IFET College of Engineering, Villupuram,  
vishwa2006kv@gamil.com, gurunathan2314@gamil.com

### **ABSTRACT**

Significant health hazards are associated with vitamin deficiencies, making early identification and prompt action necessary. This presentation presents a unique defect detection method that combines neural networks with image processing. Advanced processing is applied to images of damaged body parts to identify key characteristics that may indicate deficits. Examining color shifts, textural variations, and structural irregularities identifies trends linked to certain defects. A neural network that has been trained to classify photos correctly may identify tiny clues for accurate detection. The method's effectiveness has been confirmed by several trials, demonstrating its potential to help medical professionals diagnose patients earlier. Its automated nature also makes screening procedures more scalable, especially in environments with limited resources.

**Keywords:** Defect detection method, Neural networks, Image processing, Early diagnosis.

*CSICA-2025-037*

**TRAFFIC LIGHT CONTROLLER FOR EMERGENCY VEHICLE  
IDENTIFICATION BASED ON COMPUTER VISION AND ACOUSTIC  
SIGNALS**

**M. Saravanan**

Assistant Professor, Department of Computer Science and Engineering  
K. Ramakrishnan College of Technology (Autonomous), Trichy.

**Charubala A, Celsi Jaya Sreejha P, Christina Emy G, Jesira Banu M**

Department of Computer Science and Engineering  
K. Ramakrishnan College of Technology (Autonomous), Trichy.  
[charuabi567@gmail.com](mailto:charuabi567@gmail.com)

**ABSTRACT**

Emergency response times are crucial for saving lives in urban environments, where traffic congestion can significantly delay the arrival of emergency vehicles. This research presents an innovative approach to address this challenge by developing an intelligent traffic light control system that prioritizes emergency vehicle passage, particularly ambulances. The system integrates computer vision technology, communication modules, and advanced control algorithms to detect approaching emergency vehicles, communicate with traffic light controllers, and adjust signal timings in real-time. A YOLO-based object detection model and a Convolutional Neural Network (CNN) are employed to classify ambulances and recognize emergency sirens with high accuracy. Experimental results demonstrate that the proposed system outperforms existing machine learning approaches, achieving enhanced accuracy and faster response times. This intelligent system has the potential to significantly improve emergency response times and optimize urban traffic management.

**Keywords:** Computer Vision, YOLO, Convolutional Neural Network, Emergency Vehicle Detection, Intelligent Traffic Control.

*CSICA-2025-038*

## **REAL-TIME SHIP DETECTION METHOD BASED ON YOLO ALGORITHM**

**V.Kalpana**

Assistant Professor, Department of Computer Science and Engineering  
K. Ramakrishnan College of Technology (Autonomous), Trichy.

**Abhishek R R, Dharshan N, Idish Adithiya V, Kalaiyamuthan T**

Department of Computer Science and Engineering  
K. Ramakrishnan College of Technology (Autonomous), Trichy.

### **ABSTRACT**

Maritime surveillance is critical for ensuring the safety and security of shipping lanes, ports, and coastal areas. The increasing demand for maritime surveillance, naval security, and oceanic traffic management necessitates accurate and efficient ship detection techniques. The proposed method is trained on maritime image datasets featuring diverse backgrounds, ship types, and environmental conditions. By optimizing the YOLO model for marine environments, the system achieves fast inference speeds while maintaining high detection accuracy. Extensive experiments demonstrate the effectiveness of the method in real-time video streams and static images, with results showing improved precision, recall, and inference time compared to traditional detection techniques. This project presents a real-time ship detection method utilizing the YOLO (You Only Look Once) algorithm, a state-of-the-art object detection framework known for its balance of speed and accuracy for real-world applications such as coastal surveillance, port monitoring, and autonomous maritime navigation. By training the YOLO model on annotated maritime datasets, the system can effectively identify and localize

ships in diverse environmental conditions, including varying scales, angles, and lighting. The implementation leverages deep convolutional neural networks to process input images or video frames and outputs bounding boxes with classification scores in real-time.

*CSICA-2025-039*

## **APPLE PLANT DISEASE DETECTION USING R-CNN**

**Rakesh Kumar S, Valliyappan P, Mohammed Hussain M**

Department of Computer Science and Engineering  
K. Ramakrishnan College of Technology (Autonomous), Trichy.  
rakeshkumarsenthilkrct@gmail.com

### **ABSTRACT**

In the agricultural sector, plant health plays a crucial role in ensuring sustainable crop production and minimizing economic losses. This project focuses on developing an advanced system for detecting diseases in apple plants using a Region-based Convolutional Neural Network (R-CNN) model. The model analyses leaf images to identify signs of diseases, providing accurate and timely diagnosis. Leveraging computer vision and deep learning, the R-CNN model enhances the precision of disease detection, enabling early intervention. Apple plants can be affected by various diseases due to factors like fungal infections, bacterial attacks, and environmental conditions. Common causes include moisture buildup, poor air circulation, insect activity, and wounds caused by harsh weather, such as strong winds that break leaves, making them vulnerable to infections. Airborne pathogens can spread rapidly, infecting leaves and leading to visible symptoms like discoloration, spots, or lesions. Early detection through this system allows farmers to take corrective measures, reducing the spread of diseases and minimizing crop damage. Additionally, a chatbot has been integrated to offer users a platform for plant-related discussions. The chatbot utilizes an external API to provide information on plant care, disease prevention, and agricultural best practices, ensuring a comprehensive support system for farmers and enthusiasts. This combined approach not only aids in early disease detection but also empowers users with knowledge, fostering proactive plant care. The project aims to improve agricultural productivity, reduce losses, and promote healthier apple orchards through technology-driven solutions

*CSICA-2025-040*

## **KNEE OSTEOARTHRITIS DETECTION FROM X-RAY IMAGES USING RESNET**

**Pragatheesh S, Sri Arul J, Yashwanth S**

K. Ramakrishnan College of Technology, Trichy.

tmspragatheesh1204@gmail.com

### **ABSTRACT**

Knee osteoarthritis (KOA) is a prevalent degenerative joint disease that significantly affects the quality of life, particularly among the elderly. Early detection and accurate grading of KOA are crucial for effective treatment and management. Traditional diagnostic methods rely heavily on visual inspection of X-ray images by radiologists, which can be subjective and prone to variability. To address these challenges, this study proposes an automated system for detecting and classifying knee osteoarthritis using deep learning techniques, specifically the ResNet (Residual Network) architecture. ResNet is well-known for its ability to handle vanishing gradient problems and to extract deep, discriminative features from images, making it highly suitable for medical image analysis. The proposed method involves preprocessing knee X-ray datasets, training the ResNet model to recognize osteoarthritic features, and evaluating its performance against standard benchmarks. The system is designed to classify the severity of KOA based on established grading systems, such as the Kellgren-Lawrence scale. Experimental results demonstrate that the ResNet-based model achieves high accuracy and robustness, outperforming traditional machine learning approaches. This research highlights the potential of deep convolutional neural networks in assisting radiologists with reliable and efficient KOA diagnosis.

*CSICA-2025-041*

## **MRI IMAGE CLASSIFICATION FOR ALZHIEMER'S USING FUSION BASED DEEP LEARNING TECHNIQUES**

**T. Dhivya**

Assistant Professor, Department of AI&DS,  
Meenakshi Sundararajan Engineering College, Chennai,  
[dhivyathirugnanam@msec.edu.in](mailto:dhivyathirugnanam@msec.edu.in)

**Dik Vijay S, Jobi Sheron Y, Thirugnanasambandam DS,**

Department of AI&DS,  
Meenakshi Sundararajan Engineering College, Chennai,  
dikvijaysm@gmail.com, jobisheron2016@gmail.com, tst87961@gmail.com

### **ABSTRACT**

Classifying medical images is necessary for many medical evaluations and instructional purposes. One of the most important problems in the world of image recognition is medical image classification, which aims to classify medical images into relevant categories for the purpose of illness diagnosis or study. But the success rate of conventional approaches has reached an end. Additionally, using them to extract and choose categorization features takes a significant amount of time and effort. One of the most common causes of dementia in older adults is Alzheimer's disease. Due to the large global population affected by metabolic illnesses, there is now much potential to use machine learning to discover cures for these conditions. Deep neural networks, a relatively new machine learning method, have shown great potential for various kinds of classification issues. In this study, an accurate and simple to-understand model for diagnosing and monitoring the progression of Alzheimer's disease was created. By following the developed procedure, medical professionals may make decisions with solid justification. By using these machine learning algorithms for early diagnosis, the death rates linked to Alzheimer's disease may be reduced. A convolutional neural network with a shallow convolution layer has been constructed in this study to detect Alzheimer's in patches of medical images. The suggested categories' overall accuracy is approximately 98%, which is higher than that of the most widely used current methods.

*CSICA-2025-042*

## **NUTRILIFE: AN AI-DRIVEN PERSONALIZED GROCERY PLANNING SYSTEM FOR HEALTHY AND AFFORDABLE LIVING**

**M. Saravanan**

Assistant Professor, Department of Computer Science and Engineering,  
K. Ramakrishna College of Technology (Autonomous), Trichy  
saravanansrce@gmail.com

**Logeshwaran P, Madhavan P, Kishore M, Nachiappan P L**

Department of Computer Science and Engineering,  
K. Ramakrishna College of Technology (Autonomous), Trichy

### **ABSTRACT**

NutriLife is an AI-based grocery planning and shopping platform that supports healthy living through personalized nutrition-based recommendations. The system enables users to receive daily or weekly grocery packages customized to their family's health profile, including Body Mass Index (BMI), existing medical conditions, food preferences, and financial status. On first login, users input editable family data which is used to generate smart, adaptable packages categorized as Normal, Special, or Premium. These suggestions align with national dietary standards and school nutrition charts, making them suitable for families with diverse needs. By integrating artificial intelligence with real-time food pricing, NutriLife offers affordable yet nutritious recommendations, reducing food waste and promoting public health. The application also facilitates purchasing of vegetables, fruits, organic items, and medicines, along with cooking tutorials and recipe suggestions based on selected plans. Future enhancements include integration with wearable health devices, multilingual support, and dynamic meal planning. This research presents NutriLife as an innovative solution to bridge the gap between nutrition, affordability, and convenience, contributing to sustainable and intelligent food consumption.

**Keywords:** AI in Healthcare, Nutrition-Based Recommendation, Smart Grocery Planning, Sustainable Living, Personalized Diet.

*CSICA-2025-043*

**VOICE - CONTROLLED OFFICE AUTOMATION: ENHANCING  
ACCESSIBILITY IN MICROSOFT WORD AND EXCEL**

**M. Saravanan**

Assistant Professor, Department of Computer Science and Engineering,  
K. Ramakrishna College of Technology (Autonomous), Trichy saravanansrce@gmail.com

**Kavin S, Praveen P, Prasanth P ,Niranjini C**

Department of Computer Science and Engineering  
K. Ramakrishna College of Technology (Autonomous), Trichy  
praveen161942@gmail.com

**ABSTRACT**

This paper presents a voice-controlled automation system for Microsoft Word and Excel, enabling users to perform document editing, formatting, and data entry tasks using natural language commands. The system leverages Python's Speech Recognition library for speech processing and the Win32Com module for seamless interaction with Microsoft Office applications. Users can open Word and Excel, dictate and edit text, apply formatting such as bold, italics, and font size adjustments, and enter data into specific Excel cells without manual input. This hands-free approach enhances productivity and accessibility, particularly for individuals with disabilities or those requiring efficient multitasking. The paper also addresses challenges related to speech recognition accuracy, command validation, and noise interference, proposing solutions to optimize performance. Future enhancements include adaptive AI-driven voice recognition, multi-language support, and extended integration with additional Office applications. The proposed system contributes to the advancement of intelligent office automation, streamlining workflow efficiency and accessibility. This paper presents a voice-controlled automation system for Microsoft Word and Excel, enabling users to perform document editing, formatting, and data entry tasks using natural language commands. The system leverages Python's Speech Recognition library for speech processing and the Win32Com module for seamless interaction with Microsoft Office applications.

*CSICA-2025-044*

**CYBERSECURITY FOR ADVANCED MEDICAL DEVICES  
WITH ENHANCED FUNCTIONALITY**

**Dr. M. Ganesan**

Associate Professor, Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

**Bharathkumar K, Muthukumaran R, Praveen S, Thirumal S**

Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

**ABSTRACT**

Pace CAP v1.0 is an AI-powered cybersecurity layer designed to protect pacemakers from cyber threats. As pacemakers become more connected via wireless technologies, they face increasing risks of unauthorized access and malicious interference. PaceCAP uses advanced machine learning, anomaly detection, and real-time analytics to monitor pacemaker behavior and detect suspicious activity. It offers secure Bluetooth connectivity and remote monitoring, reducing the need for frequent hospital visits. Through a user-friendly interface, it enables seamless data sharing between patients and healthcare providers, enhancing both safety and convenience. This innovation aims to improve the security, reliability, and usability of implantable cardiac devices for better patient outcomes.

*CSICA-2025-045*

## **FAKE REVIEWS DETECTION USING MACHINE LEARNING AND DEEP LEARNING ALGORITHMS**

**S. Karthik**

Assistant Professor, Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

**Jayashri Hamalatha G, Prakash Raj R, Ramkumar S, Vikram G**

Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

### **ABSTRACT**

In the modern digital era, counterfeit reviews are a critical issue because they are generally used to manipulate users, influence opinions, and make money. Fake reviews have the ability to manipulate consumer perception, affect business reputation, and destroy user trust. Our project addresses this problem by detecting fake reviews using deep learning methods with TensorFlow. We used the Fake Reviews News Dataset, which includes labeled real and fake reviews, examining both the review headline and the body for better context understanding. Different classification models like K-Nearest Neighbors (KNN), Support Vector Machine (SVM), Convolutional Neural Networks (CNN), and Neural Networks (NN) were used to increase the accuracy of detection. This is particularly vital for media websites that rely on genuine content in order to continue reader trust and ad revenue. With fake reviews usually written by humans or robots growing exponentially across social networks, real-time automatic detection tools are now necessary in order to sustain information integrity within society.

CSICA-2025-046

## WEATHER INTELLIGENCE: UNLOCKING MACHINE LEARNING'S POTENTIAL IN METEOROLOGY

**D. Vanathi**

Assistant Professor, Department of Computer Science and Engineering,  
Pandian Saraswathi Yadav Engineering College  
vanathid19@gmail.com

**Ms. Swetha D**

Department of Computer Science and Engineering,  
Pandian Saraswathi Yadav Engineering College  
swe28d@gmail.com

### ABSTRACT

Weather forecasting is a critical task with widespread applications in agriculture, transportation, disaster management, and daily planning. This project explores the application of machine learning algorithms to predict weather conditions based on historical meteorological data. The study compares the performance of four machine learning models: Artificial Neural Networks (ANN), XGBoost, Random Forest Regressor, and Linear Regression. The dataset used includes features such as Temperature, Humidity, Atmospheric Pressure, and Wind Speed, and the target variable is the weather condition or a related quantitative measure. Data preprocessing involves handling missing values, feature scaling for ANN, and encoding categorical variables if necessary. The models are trained and evaluated using key regression metrics, including MSE, MAE, and R<sup>2</sup> Score. Experimental results demonstrate that the XGBoost algorithm consistently outperforms other models in terms of accuracy and robustness, achieving the lowest MSE and MAE values and the highest R<sup>2</sup> Score. This project showcases the potential of advanced machine learning techniques for accurate weather prediction, emphasizing the importance of model selection and hyper parameter tuning in achieving optimal performance. The results provide a foundation for further development of automated weather forecasting systems that can adapt to complex and non-linear meteorological patterns. **Keywords:** Mean Squared Error (MSE), Mean Absolute Error (MAE), Artificial Neural Networks (ANN), XGBoost, RF Regressor and Linear Regression, Prediction Models, Weather Prediction, Temperature, Feature Scaling, Time Series Forecasting.

*CSICA-2025-047*

## **SECURE BLOCKCHAIN PROTOCOL FOR OFFLINE PAYMENT TRANSACTION**

**R. Rajavarman**

Assistant Professor, Department of Computer Science and Engineering,  
K. Ramakrishna College of Technology (Autonomous), Trichy - 621112

**S Arulmozhi Varman, S Chinrasu, A Haemjeyent, J Kishore**

Department of Computer Science and Engineering,  
K. Ramakrishna College of Technology (Autonomous), Trichy - 621112,

### **ABSTRACT**

Offline payments help solve blockchain scalability issues and allow transactions without a constant internet connection. However, existing solutions struggle to balance security, flexibility, and usability. To address this, we propose a new blockchain-based offline payment system that enhances security while maintaining ease of use. Our system introduces features like offline payment splitting, customizable transaction notes, and a spending tracker to help users manage their finances. It also includes priority-based transaction syncing, ensuring urgent payments are updated first when online. To improve privacy, an incognito mode hides transactions until they are synchronized. Security is strengthened with an offline PIN and digital receipt generation, providing proof of transactions. Users can also request payments offline, allowing seamless transactions even in disconnected environments. The protocol supports multi-device compatibility and does not rely on a single blockchain network. We evaluate our system using practical testing and real-world attack scenarios, proving its efficiency and security. Our findings show that the proposed system enhances reliability, reduces fraud risks, and improves user experience. This work contributes to the development of secure, flexible, and user-friendly offline payment solutions for blockchain transactions.

*CSICA-2025-048*

## A COMPREHENSIVE REVIEW ON ENSEMBLE MODELS IN MACHINE LEARNING

**Dr. S. Banumathi**

Assistant Professor, Department of Computer Applications,  
Bishop Heber College, Trichy, Tamilnadu, India.

banu15.sm@gmail.com

### **ABSTRACT**

Ensemble learning techniques in machine learning have gained prominence due to their ability to improve model performance by combining multiple base models to enhance predictive accuracy and robustness. These methods capitalize on the diversity of individual learners, reducing variance, bias, or both, and are often employed in both supervised and unsupervised learning tasks. Popular ensemble methods such as bagging, boosting, stacking, and voting play a crucial role in addressing challenges like overfitting, underfitting, and poor generalization. Bagging techniques, such as Random Forest, reduce variance by averaging predictions from multiple models, while boosting methods, like AdaBoost and Gradient Boosting, improve performance by focusing on harder-to-predict instances. Stacking, on the other hand, integrates diverse models to learn from their collective knowledge through a meta-model. Despite their effectiveness, ensemble models come with computational and interpretability costs, which often necessitate sophisticated tuning and model selection processes. This review provides a comprehensive exploration of ensemble methods, highlighting their advantages, limitations, and current advancements in model optimization. Moreover, recent research on ensemble strategies for deep learning, hybrid approaches, and ensemble diversity is discussed, positioning them as pivotal in the evolution of machine learning systems.

**Keywords:** Ensemble learning, bagging, boosting, stacking, Random Forest, AdaBoost, Gradient Boosting, model optimization, deep learning, hybrid approaches.

*CSICA-2025-049*

**ADVANCED AUTOMATED INVENTORY MANAGEMENT:  
INTEGRATING REAL TIME TRACKING, ERROR-FREE  
FULFILLMENT AND INTELLIGENT WAREHOUSE AUTOMATION  
FOR OPERATIONAL EXCELLENCE**

**DR.C. Rajesh Kannan**

Professor & Head, Department of CSE  
Suguna College of Engineering, Coimbatore.

**Vijay Anand A, Anushaa B, Murugadas V, Janani P V**

Department of CSE, Suguna College of Engineering, Coimbatore.

**ABSTRACT**

Automating inventory management in small warehouses is a pivotal strategy for enhancing operational efficiency, reducing costs, and minimizing human errors. This project explores integra Hindusthanting advanced technologies and methodologies to streamline inventory processes, focusing on real-time stock tracking, automated order fulfillment, and strategies to minimize human error. By leveraging technologies such as Radio Frequency Identification (RFID), and barcode scanners, this project aims to provide real-time updates on inventory levels, ensuring accuracy and preventing stock discrepancies. Additionally, the implementation of robotic systems, including Robotic Mobile Fulfillment Systems (RMFS) and Automated Guided Vehicles (AGVs), alongside software integration with Warehouse Management Systems (WMS) and Order Management Systems (OMS), is examined to enhance order fulfillment efficiency. The project also addresses common sources of human error, such as data entry and picking errors, and proposes automated solutions to mitigate these issues. Case studies of successful implementations in small e-commerce and automotive parts warehouses highlight the benefits and challenges of automation, providing insights into best practices. overcome these obstacles. As technology continues to advance, this project underscores the potential of warehouse automation to drive greater efficiency and accuracy in inventory management, ultimately leading to improved customer satisfaction and operational.

*CSICA-2025-050*

## **ARCHIVE ACCESS: PRESERVING MANUSCRIPT HISTORY WITH OCR**

**Dr. C. Rajesh Kannan**

Professor & Head, Department of CSE  
Suguna College of Engineering, Coimbatore.

**Dr. K. Manojkumar**

Professor & Head, Department of AI&DS  
Suguna College of Engineering, Coimbatore.

**Karthick Balaji R, Harish R, Gokul S, Sri Yuthesh Varsha B.**

Department of CSE, Suguna College of Engineering, Coimbatore.

### **ABSTRACT**

The OCR (Optical Character Recognition) has reached its advancement in the technology as it now extracts all the texts in all languages that are handwritten and makes it into the digital copies and processes them automatically. This paper will introduce an efficient Tamil OCR system that uses deep learning principles such as CRAFT, which is used for text detection, and PARSeq for the character recognition in the text. The system is general and can handle different languages, it can even combine translation of Tamil into English and a convenient Tkinter interface, which can be used for real-time document processing. Additionally, to date, this research has been mainly focused on developing deep learning models and implementations so to specifically detect images in stonework, while the same approach is seen as the main idea in applying deep learning to images. It is realized that efficient recognition of texts and then diverse applications of the content become feasible by implementing deep learning's innovative approaches. In addition to this, deep learning techniques have already been widely used in image recognition and other applications. It is argued that deep learning will bring significant changes and improvements in the field of audio transcriptions.

**Keywords:** OCR, Tamil Character Recognition, Deep Learning, CRAFT, PARSeq, Translation.

*CSICA-2025-051*

## **HERITAGE VOICE ASSISTANT: A MULTILINGUAL AI POWERED SYSTEM FOR REAL-TIME HERITAGE SITE EXPLORATION**

**Dr. C. Rajesh Kannan**

Professor & Head, Department of CSE  
Suguna College of Engineering, Coimbatore.

**Mrs. P. Nandhini**

Assistant Professor, Department of CSE  
Suguna College of Engineering, Coimbatore.

**Syam Davincy C, Ajay S, Raghuprasanth K, Kesavaboopathi S.**

Department of CSE, Suguna College of Engineering, Coimbatore.

### **ABSTRACT**

Heritage sites play a crucial role in preserving cultural history and attracting tourists worldwide. However, conventional methods of heritage site exploration often rely on static information sources such as guidebooks, signboards, and pre-recorded audio guides. These approaches lack personalization, real-time updates, and multilingual support, making it difficult for international tourists to fully engage with the historical significance of these sites. To overcome these limitations, this paper proposes a real-time, multilingual voice assisted system designed to enhance tourism experiences at heritage sites in Tamil Nadu. The proposed system integrates artificial intelligence (AI) and natural language processing (NLP) techniques to provide tourists with immersive, voice-based insights about historical landmarks. The system leverages an advanced language model (LLM) for real-time translation and speech synthesis using Google Text-to-Speech (GTTS) and Mozilla TTS (MTTS). Furthermore, Firebase is employed for dynamic data updates, ensuring that tourists receive the latest, most accurate information about heritage sites. The project also includes real-time synchronization with Google Sheets, an interactive web dashboard for administrators, and role-based access control to maintain data integrity. The results demonstrate that the system effectively delivers multilingual, personalized insights with low latency, significantly improving the user experience in heritage tourism.

*CSICA-2025-052*

**IMPLEMENTING SYSTEMATIC APPROACHES TO ENHANCE  
CROP YIELD MANAGEMENT: STRATEGIES FOR  
AGRICULTURAL LEADERS**

**Dr. V. Nirmalrani**

Professor, Department of CSE,  
Sathyabama Institute of Science and Technology, Chennai,  
nirmalrani.it@sathyabama.ac.in

**M. Joseph**

Department of CSE,  
Sathyabama Institute of Science and Technology, Chennai.  
josephkaranai@gmail.com

**ABSTRACT**

This paper describes effectively distribute crops in modern agriculture, seamless coordination between farmers, storage units, and markets is essential. This project presents a unified application that combines three key modules: Farmers, Warehouse, and Market, designed to improve operations, boost collaboration, and enhance efficiency. The Farmers Module enables farmers to monitor crop data, arrange transportation for their yields, and receive up-to-date market price notifications via email. The Warehouse Module focuses on optimizing crop storage management, inventory control, and spatial allocation, ensuring real-time data synchronization. The Market Module allows markets to add premiums to crops, manage incoming goods, and supervise distribution activities. Facial recognition technology is incorporated to provide secure access within warehouse, enhancing safety. Real-time synchronization across modules ensures the flow of accurate, up-to-date data. Additionally, the integration of transportation services supports prompt crop deliveries, minimizing delays. This system reduces logistical barriers in the agricultural supply chain, fosters collaboration, and elevates overall efficiency.

**Keywords:** Market, Farmer, Warehouse, Supply chain, Logistics barrier.

*CSICA-2025-053*

## **AI-DRIVEN SMART HEALTHCARE ASSISTANT FOR EARLY DISEASE DETECTION AND DIAGNOSIS**

**Naveen M, Surendar Vijay C, Thanaventhana V, Reasudeen S.**  
AVS Engineering College, Salem.

### **ABSTRACT**

"AI-Powered Healthcare Assistant for Disease Prediction and Risk Assessment" aims to develop such a smart system using Artificial Intelligence (AI) so that it may support early diagnosis in addition to health risk evaluation. The system is able to process a range of medical inputs. Patient symptoms, blood test reports, as well as diagnostic images such as X-rays or scans, are several examples used in order to provide accurate disease predictions in addition to accurate risk levels. For image analysis, Deep Learning is used; for understanding textual symptom data, Natural Language Processing (NLP) is used; and according to historical health records, Machine Learning algorithms are used for predicting disease outcomes. A cloud-based system manages the entirety of data securely for both safety and scalability. The assistant is designed in such a way that it can be accessed by way of a web or mobile interface, so therefore, it is easy for both patients and healthcare providers to use. Informed medical decision-making is supported as well as offering real-time recommendations and risk alerts. This system is particularly helpful because it enables diagnoses at a faster rate, reduces errors done manually, and improves overall healthcare accessibility in areas with limited amounts of medical resources. The solution's builders intend for it to be practical, cost-effective, and scalable for real-world medical applications.

*CSICA-2025-054*

## **STUDENT DATA MANAGEMENT SYSTEM**

**Mohan Raj Vijayan**

Assistant Professor, Department of Computer Science Engineering  
Meenakshi Sundararajan Engineering College, Chennai  
mohanrajvijayan@msec.edu.in

**Pavithra S, Neha M Thamizhini S**

Department of Computer Science Engineering  
Meenakshi Sundararajan Engineering College, Chennai  
mailmepavithras27@msec.edu.in

### **ABSTRACT**

Student Data Management System (SDMS) is to optimize the storage, retrieval and, organize student information within the boundaries of educational institutions. The details of personal information, academic history, and other records are maintained, edited, and accessed using CRUD (Create, Read, Update, and Delete) operations. This methodology also includes data entry options with key functionalities of drop-down access to student profiles for Create, Read, Update, and Delete. An auto clearing new entries then displaying images of each student are retrieved and managed. Here, we have used around 200 students' data and analyzed the construction of student profile in richer insight of SDMS. Therefore, it enhances administrative efficiency by making it a robust solution for modern educational needs.

**Keywords:** Student Data, CRUD, MySQL database, Sem marks

*CSICA-2025-055*

## **FLIGHT ROUTES AND AIRLINES ANALYSIS USING DIJKSTRA ALGORITHM**

**Mohan Raj Vijayan**

Assistant Professor, Department of Information Technology  
Meenakshi Sundararajan Engineering College, Chennai  
mohanrajvijayan@msec.edu.in

**Vinith A, Venkatesan. K.S**

Department of Information Technology  
Meenakshi Sundararajan Engineering College, Chennai  
aniranjankumar05@gmail.com

### **ABSTRACT**

The Flight Network Finder and Visualizer System is a web-based interactive application through which users can query, compare, and improve flight paths across the world's airports. Powered by real-time information from the AviationStack API, it acquires live flights on the basis of source and destination airport IATA codes in real time. It combines preprocessed data for airports, routes, and airlines to build a weighted directed graph where distances are determined by using the Haversine formula. Using Dijkstra's algorithm, the app calculates the shortest flight routes and displays them on an animated Folium map embedded through Streamlit. Some of the most important features are real-time flight tracking, shortest-path visualization, CSV export of search results, and responsive UI elements for smooth user interaction. With a modular design consisting of six functional modules, this tool is useful for aviation analysts, travelers, and researchers who need intuitive and data-driven solutions in air route planning and network optimization.

**Keywords:** Dijkstra's Algorithm, Haversine Formula, AviationStack API, Graph-Based Pathfinding

**ICSICA-2025-056**

**TAMIL NEWS CLASSIFICATION SYSTEM USING NAÏVE  
BAYES**

**Mohan Raj Vijayan**

Assistant Professor, Department of Computer Science Engineering  
Meenakshi Sundararajan Engineering College, Chennai  
mohanrajvijayan@msec.edu.in

**Abhay Kesav P D**

Department of Information Technology  
Meenakshi Sundararajan Engineering College, Chennai  
abhay.kesav2004@gmail.com

**ABSTRACT**

Tamil News Classifier predicts the categories of Tamil news articles using their textual content to expedite both Tamil and translated English inputs through the categorization process. A multiclass classifier makes use of the algorithm of multinomial Naive Bayes trained on a preprocessed dataset of news articles, using TF-IDF for transformation of textual data into numerical features; this eventually results in an accuracy rate that is high enough to classify news articles. The methodology involved cleaning the text for removal of punctuation, whitespace, and stop words before classification. A translation feature based on Google Translate enables the conversion of non-Tamil text into Tamil and hence ensures proper classification. All collected feedback data are saved as a CSV file, so the model continues to be updated and refined in order to provide better performance in the event of retraining in the future. Further improvements include an enlarged dataset, more languages, and advanced deep learning models such as BERT to improve accuracy and scalability of the tool so that strength doesn't go down in the area of automatic Tamil news categorization.

**Keywords:** TF-IDF, Multiclass Classifier, Naïve Bayes, Tamil News Classification System.

*ICSICA-2025-057*

## **TIMETABLE GENERATOR USING TEMPORAL PLANNING**

**Mohan Raj Vijayan**

Assistant Professor, Department of Computer Science Engineering  
Meenakshi Sundararajan Engineering College, Chennai  
mohanrajvijayan@msec.edu.in

**Aishwarya k, Poorva M, Priyadarshini T**

Department of Information Technology  
Meenakshi Sundararajan Engineering College, Chennai  
[aishwaryak2703@gmail.com](mailto:aishwaryak2703@gmail.com)

### **ABSTRACT**

The Timetable Generation System helps streamline and optimize academic scheduling in an educational institution by helping to generate the following types of schedules: Class, Teacher, Student, Department, Generation of Room Allocation, Exam, and Laboratory/Practical Timetable. This project mainly deals with generating Class Timetables and Teacher Timetables efficiently using a temporal planning algorithm such that the same subjects can be scheduled without conflicts in time slots. A key feature in the temporal planning algorithm is that it dynamically handles scheduling constraints and dependencies, hence ensuring an optimized conflict-free timetable for various tasks based on their relationship and overlap resolution. Using all the input data, the system reduced administrative workloads and resulted in very efficient timetables without any overlap of classes.

**Keywords:** Timetable Generation, Conflict-Free Scheduling, Temporal Planning Algorithm, Automated Scheduling

*ICSICA-2025-058*

## **STAFF PROFILE MANAGEMENT SYSTEM**

**Mohan Raj Vijayan**

Assistant Professor, Department of Computer Science Engineering  
Meenakshi Sundararajan Engineering College, Chennai  
mohanrajvijayan@msec.edu.in

**Niranjan Kumar A, Harish Kumar S**

Department of Information Technology  
Meenakshi Sundararajan Engineering College, Chennai  
aniranjankumar05@gmail.com

### **ABSTRACT**

The Staff Profiles Management System, in essence, is an enhancement on storing, retrieving, and organizing staff information in educational institutions. It streamlines personal information, activity records, and academic contributions using the CRUD methodology. This system provides an intuitive interface with dropdown menus for efficient profile access, which simplifies CRUD operations. One of the main features of SPMS is that it self-clears newly entered data automatically, preserving history while keeping the system organized. In addition, staff pictures are automatically retrieved and displayed, which presents a smooth user experience to any client. Staff details are also updated with automated administration, and activities as well as scientific works are followed in the system, reducing much manual input and errors. The system provides a cost-effective, flexible, and advanced solution adapted to the dynamic needs of the educational institutions involved. SPMS digitizes the staff profile, increasing efficiency and accessibility of data that will be used in numerous analyses to establish better decisions. Flexibility means that it is ready to change up with the ever-changing needs within an institution, making it future-ready for academic administration. Besides making life easier, SPMS encourages digital transformation in the learning institutes, gradually developing into a centralized and more user-friendly platform for accessing staff information.

**Keywords:** React, TypeScript, Firebase database, Student Management System

*ICSICA-2025-059*

**AI-BASED REAL-TIME DIAGNOSTIC SYSTEM FOR EARLY  
DETECTION AND PREDICTION OF SKIN DISORDER**

**S.R. Saranya**

Assistant Professor, Department of Artificial Intelligence and Data Science  
Muthayammal College of Engineering, Rasipuram  
sr.saranya88@gmail.com

**Sanjay.R, Boopathi.R, Lingeshwaran M**

Department of Artificial Intelligence and Data Science  
Muthayammal College of Engineering, Rasipuram

**ABSTRACT**

Enhancing Dermatological Diagnosis with Deep Learning for Skin Disease Detection is an AI-powered website designed to predict and classify skin diseases using deep learning and NLP. Users can upload images of their skin conditions, which are analyzed using a Convolutional Neural Network (CNN) to detect and identify skin problems such as a sacne, eczema, psoriasis, and melanoma. Once a disease is detected, the system provides a detailed explanation of its causes, symptoms, and risk factors. It also offers personalized recommendations, including suitable medications and advanced treatment options such as chemical peeling, laser therapy, or phototherapy. Additionally, the system estimates the recovery timeline, helping users understand the expected healing process. A progress-tracking feature allows users to upload follow-up images, enabling continuous monitoring of treatment effectiveness. The website also utilizes NLP models like BERT or GPT to generate detailed health reports, enhancing user awareness and decision-making. Developed using Python in VS Code, this AI-powered solution ensures accurate, efficient, and user-friendly dermatological diagnosis.

*ICSICA-2025-60*

**EXPLAINABLE AI FOR CROP RECOMMENDATION, YIELD  
FORECASTING AND RAINFALL PREDICTION IN SMART  
AGRICULTURE**

**S. Vatchala**

Assistant Professor, School of Computer Science and Engineering

Vellore Institute of Technology, Chennai

vatchala.s@vit.ac.in

**P.Kiruthiga, D.Vijayakumar**

Faculty of IT & Computer Science Engineering (Cyber Security)

Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur

**ABSTRACT**

Predictive modeling stands essential for smart agriculture advancement because these models produce improved crop management systems as well as yield and rainfall prediction outputs. The analysis utilizes Decision Tree with Random Forest as well as AdaBoost and XGBoost and Support Vector Classifier (SVC) and Recurrent Neural Network (RNN) and Convolutional Neural Network (CNN) and Artificial Neural Network (ANN). The predictive models utilize past crop data and meteorological information and environmental pattern data to generate predictions needed for strategic decision-making. The XAI techniques allow farmers to interpret model predictions using simple explanations without compromising model transparency that users can access throughout the prediction framework. The XGBoost and AdaBoost administrative algorithms enhance predictive quality while Decision Tree and Random Forest models maintain efficient and scalable analysis of large-scale agricultural data. RNN and CNN architectures perform joint analysis of agricultural data to solve spatial and temporal evaluation problems.

**Keywords:** Smart Agriculture, Predictive Modelling, Weather Forecasting, Environmental Monitoring, Machine Learning, Deep Learning, XGBoost, Random Forest, Recurrent Neural Network (RNN), Convolutional Neural Network (CNN), Artificial Neural Network(ANN),

ICSICA-2025-61

**SYSTEMATIC BENCHMARKING OF GRIDSEARCHCV,  
RANDOMIZEDSEARCHCV, AND OPTUNA FOR HYPERPARAMETER  
OPTIMIZATION IN CROP YIELD PREDICTION**

S Jayanthi\*<sup>1</sup>, Gunda Vanitha\*<sup>2</sup>, Srujana Inturi<sup>3</sup>, Bandi Nageshwar Rao<sup>4</sup>, Karthik  
Karmakonda<sup>5</sup>, Guguloth Ravi<sup>6</sup>

<sup>1</sup>Senior Assistant Professor,  
Department of AI & Data Science,  
Faculty of Science and Technology, IcfaiTech,  
ICFAI Foundation for Higher Education  
(IFHE),  
Hyderabad, Telangana – 501503, India.  
drsjayanthicse@gmail.com

<sup>2</sup> Associate Professor,  
Department of Computer Science and  
Engineering  
Chaitanya Bharathi Institute of Technology,  
Hyderabad, Telangana - 500075  
gvanitha\_cse@cbit.ac.in

<sup>3</sup> Assistant Professor,  
Department of Computer Science and  
Engineering  
Chaitanya Bharathi Institute of Technology,  
Hyderabad, Telangana - 500075  
isrujana\_cse@cbit.ac.in

<sup>3</sup>Associate professor,  
Department of Cyber Security & IoT,  
School of Engineering,  
Malla Reddy University  
Hyderabad, Telangana 500100, India.  
nagesh.south@gmail.com

<sup>5</sup>Associate Professor  
Department of Computer Science and  
Engineering  
CVR College of Engineering  
Hyderabad, Telangana 501510  
karthik.5786@gmail.com

<sup>6</sup>Associate professor,  
Department of Computer Science and  
Engineering,  
Malla Reddy College of Engineering and  
Technology  
Hyderabad, Telangana - 500100  
g.raviraja@gmail.com

## ABSTRACT

Accurate crop yield prediction (CYP) is crucial for improving agriculture and ensuring food security. This research systematically compares the efficacy of three hyperparameter tuning methods GridSearchCV (GSCV), RandomizedSearchCV (RSCV), and Optuna (OPT) across five machine learning models: Decision Tree (DT), Random Forest (RF), Gradient Boosting (GB), XGBoost (XGB), and LightGBM (LGBM) for CYP. The objective of this study is twofold: the first is to study the efficiency of the tuning methods, and the second is to determine how the selection of tuning methods impacts the performance and computational efficiency of models. The analysis is carried out on a CYP dataset with key predictive variables such as cultivated area, crop type, yield, pesticide usage, rainfall, and temperature. A correctly implemented nested cross-validation process guarantees that a robust model evaluation is achieved with reduced bias. Performance is evaluated using standard metrics, and the time taken for hyperparameter tuning and model training is also recorded. The results demonstrate that OPT outperforms traditional tuning strategies, achieving the lowest MSE ( $1.08 \times 10^7$ ), RMSE (3280.77), MAE (432.30) with RF while at the same time achieving the highest R2 (0.9987), and EVS (0.9987). Despite these gains, OPT's tuning time for RF (228.16 seconds) was longer than GridSearchCV's (GSCV) (180.03 seconds), suggesting a more significant computational cost. RSCV balances both accuracy and efficiency with a broader variance in hyperparameter selection. The results of this study ascertain that while OPT can optimize hyperparameters effectively, it is not necessarily the most computationally efficient tuning method in every scenario. The insights gained here support the selection of tuning parameters for ML-based CYP systems with limited resources.

**Keywords:** Hyperparameter tuning, regression models, GridSearchCV (GSCV), RandomizedSearchCV (RSCV), Optuna (OPT), nested cross-validation, computational cost, crop yield prediction (CYP), Random Forest (RF), XGBoost (XGB)

*ICSICA-2025-62*

## **IMPROVED MANGO LEAF DISEASE CLASSIFICATION USING EFFICIENTNET AND AUGMENTED DATA**

**Mohamed Anash A, Mohamed Hasan Faris M, Sakthinathan R**

Department of Computer Science and Engineering,  
Periyar Maniammai Institute of Science and Technology, Thanjavur 613403

### **ABSTRACT**

Early disease detection in plants is important to achieve maximum crop yield and promote sustainable agriculture. This research explores the impact of data augmentation methods on the performance of mango leaf disease classification based on deep learning. Comparative evaluations were done with EfficientNetB0—a simple and lightweight convolutional neural network—on two datasets: original images and augmented images with rotation, flip, shear, brightness and channel shift. The 8 disease-class Mango Leaf Disease Dataset was used. The new model architecture consisted of a transfer learning backbone pre-trained on ImageNet, densely regularized layers, and softmax classification. Results indicate the larger dataset enhanced classification accuracy by 12.21% with validation accuracy of 67.47% compared to 55.26% accuracy of the baseline dataset. Additional analysis indicated improved F1-scores and less misclassification, especially for minority classes. The study concludes that data augmentation significantly improves model generalization and resilience and is a promising approach for real-world plant disease detection systems. The results prove the potential of combined application of advanced augmentation with transfer learning for precision agriculture purposes.

**Keywords:** Mango leaf disease, data augmentation, EfficientNet, deep learning, classification accuracy

*ICSICA-2025-63*

**DUAL-STAGE AI FRAMEWORK FOR ACUTE APPENDICITIS  
DIAGNOSIS USING CLINICAL AND CONTRAST ENHANCED  
CT DATA WITH GAN AUGMENTATION**

**Akshaya Saravanan S, Mohammed Faizal S,  
Arulmozhivarman S, Appavu Alias Balamurugan S**

Department of CSE,  
Periyar Maniammai Institute of Science and Technology,  
Thanjavur - 613403

**ABSTRACT**

Acute appendicitis is a common surgical emergency that requires timely diagnosis and intervention to prevent complications. Traditional diagnostic approaches can be inefficient, leading to misdiagnosis and unnecessary surgeries. This project presents a two-stage automated detection system that enhances the diagnostic accuracy of acute appendicitis by integrating clinical data analysis with advanced imaging techniques. The first stage employs a Feedforward Neural Network (FNN) to analyze clinical data, assessing the likelihood of appendicitis based on patient symptoms and history. For high-risk cases, the second stage utilizes Generative Adversarial Networks (GANs) to augment contrast-enhanced CT scan images, enhancing the dataset and improving classification accuracy through a Convolutional Neural Network (CNN). This dual approach aims to reduce undetected cases and minimize unnecessary surgeries, ultimately improving patient outcomes

**Keywords:** Acute Appendicitis, Automated Detection, Generative Adversarial Networks, Contrast-Enhanced CT scans, Machine Learning, Clinical Data Analysis, Convolutional Neural Networks.

*ICSICA-2025-64*

## **EMPOWERING ACCESSIBILITY TO HISTORICAL RECORDS THROUGH AI AND OCR TECHNOLOGY**

**Habith K,Dinesh Kumar S,Dhineshkumar V,Nandesh M**

AVS Engineering College, Salem.

### **ABSTRACT**

The accessibility of historical records plays a crucial role in preserving cultural heritage and enabling research. However, many historical documents, particularly those in handwritten or printed formats, remain inaccessible to the wider public due to their age, fragility, and the challenges posed by traditional methods of preservation. This paper explores the integration of Artificial Intelligence (AI) and Optical Character Recognition (OCR) technology as powerful tools to bridge this accessibility gap. By leveraging advanced machine learning algorithms and OCR systems, historical records can be digitized, transcribed, and made searchable, offering unprecedented access to archives that were previously difficult to interpret or retrieve. This research discusses the current capabilities and limitations of AI and OCR in processing various types of historical documents, including manuscripts, maps, and photographs. Additionally, the paper highlights case studies where these technologies have been successfully applied to enhance the accessibility of records in various languages, scripts, and formats. The potential of AI-powered systems to automate transcription, detect historical patterns, and translate ancient texts further emphasizes the transformative impact of these technologies. Ultimately, this paper underscores the need for continued innovation and collaboration to ensure that historical knowledge is preserved, accessible, and usable for future generations, making the past more inclusive and open for exploration.

*ICSICA-2025-65*

**LEVERAGING PREDICTIVE ANALYTICS AND MACHINE  
LEARNING FOR EMPLOYEE RETENTION AND PERFORMANCE  
MANAGEMENT IN HUMAN RESOURCE**

**Dr V Karthiga**

School of Management,  
Sastra Deemed to be University, Thanjavur.

**ABSTRACT**

The new challenge for contemporary organizations is the retention of their workforce as well as performance management. As changes in the modern work environment are ever-emerging, Human Resource (HR) departments must enact more informed, data-driven policies about the management of people within their organizations. In that light, this paper attempts to discuss how the implementation of predictive analytics by leveraging machine learning could offer practical solutions to such contemporary HR problems. ML models will predict risks of turnover and high potentials from historical employee data to improve workforce planning. Various algorithms of ML discussed include logistic regression, decision trees, random forests, and neural networks, among others. The study also points out how such ML algorithms can be used to predict employee attrition and performance trends. Supporting this can further be done by case studies from leading companies, which will establish that these techniques are quite effective in reducing turnover and improving productivity. It will explore the opportunities, challenges, and future trends of the integration of predictive analytics in HR practices. The finding highlights the potential of predictive models in the transformation of decisions in the HR function to ensure that organizations utilize actionable insights in their strategic workforce management.

*ICSICA-2025-66*

**OPTIMIZED DIABETIC RETINOPATHY DETECTION: A TRANSFER  
LEARNING APPROACH WITH MAXIMUM POOLING ENHANCED  
CNN**

**S. Uma Mageshwari**

Assistant Professor, K.Ramakrishnan College of Technology, Trichy

**Abhishek N.S, Akash S, Dineshkumar P, Harishan S.U**

K.Ramakrishnan College of Technology, Trichy

**ABSTRACT**

Diabetic retinopathy (DR) is a leading cause of blindness among individuals with diabetes, particularly affecting those who have had diabetes for over 10 years. It is most prevalent in the 70-79 age group, with early symptoms including blurred vision, difficulty in color perception, and dark spots in the visual field. As DR often presents minimal early symptoms, it frequently goes undiagnosed until advanced stages, delaying treatment. Manual detection of DR through retinal images is time-consuming and highly dependent on the expertise of ophthalmologists. This study proposes an optimized deep learning approach for detecting and classifying DR using retinal images, utilizing transfer learning with a Maximum Pooling Enhanced Convolutional Neural Network (CNN). By leveraging pre-trained networks and enhancing pooling layers, the model is designed to improve feature extraction and classification performance. The dataset consists of retinal images categorized into five stages of diabetic retinopathy. Experimental results show that the proposed CNN-based model achieves an accuracy of 80%, outperforming traditional machine learning methods. This study demonstrates the potential of deep learning with transfer learning and enhanced pooling strategies for early and accurate detection of diabetic retinopathy, enabling timely medical intervention and improving patient outcomes.

ICSICA-2025-67

## STUDENT PROFILE MANAGEMENT SYSTEM

**Mohan Raj Vijayan**

Assistant Professor, Department of Computer Science Engineering  
Meenakshi Sundararajan Engineering College, Chennai  
mohanrajvijayan@msec.edu.in

**Sathish G, Yogeshwaran N**

Department of Information Technology  
Meenakshi Sundararajan Engineering College, Chennai  
sathishgp0212@gmail.com

### ABSTRACT

The Student Management System (SMS) is a comprehensive application designed to streamline both administrative and academic operations within an educational institution. Developed using React with TypeScript, the application offers a robust and scalable user interface along with efficient state management. Key functionalities include student registration, profile management, class scheduling, and notice publication. The system features a secure admin dashboard for managing 197 student records, reviewing reports, and publishing important updates. Students are provided with individual access to track academic progress and receive notifications. The application also incorporates secured login and authentication mechanisms to ensure data privacy. With a modular architecture, the system is designed for future scalability and feature enhancements. This project aims to digitalize student management processes, reduce manual workload, and improve accessibility to educational information through modern web technologies.

**Keywords:** React, TypeScript, Firebase database, Student Management System

*ICSICA-2025-68*

## INTERVIEW QUIZ APPLICATION

**Mohan Raj Vijayan**

Assistant Professor, Department of Computer Science Engineering  
Meenakshi Sundararajan Engineering College, Chennai  
[mohanrajvijayan@msec.edu.in](mailto:mohanrajvijayan@msec.edu.in)

**Vishwa Bharathi V, Vinoth Kumar M, Abhigna I.V.K.S.C**

Department of Information Technology  
Meenakshi Sundararajan Engineering College, Chennai  
[sathishgp0212@gmail.com](mailto:sathishgp0212@gmail.com)

### ABSTRACT

The Interview Quiz Application is an interactive, internet-based site designed to enhance interview preparation. The front-end is built using React and powered by TypeScript, and it offers a dynamic and user-friendly interface by which a user can select five subjects from ten, available based on preference. The application provides a fluid quiz experience with the assessment of performance in the form of scoring. Accessibility across different devices makes it a great application for students and professionals wanting to take a quiz to test and enhance their knowledge effectively. The application is developed using a modular structure, using TypeScript for strong-type safety and Tailwind CSS for clean styling. The core functionality revolves around fetching and managing quiz data, implemented through reusable components such as 'Quiz.tsx', 'SubjectSelection.tsx', and 'Result.tsx'. The result persists within the backend integration, and the users have a printout option to save and study their scores. The login system enhances the user-friendly experience as it shows the user's name during the quiz. In addition, the application focuses on responsive design with high interactivity and feedback in real-time to provide an engaging experience for learning. The purpose of this project is to fill the gap between conventional learning and modern, technology-based solutions. Through the component-based architecture of React, the application delivers a scalable, maintainable codebase.

*ICSICA-2025-69*

**SPYUSB: SECURING USB DRIVES AGAINST MALWARE  
INJECTION AND DATA EXFILTRATION**

**M. Vidhya**

Assistant Professor in Computer Applications  
Srinivasan College of Arts & Science, Perambalur  
vidhyam05@gmail.com

**ABSTRACT**

Portable storage devices, such as USB drives, external hard drives, and memory cards, are widely used for transferring and storing data due to their portability and ease of use. However, they are highly susceptible to covert data theft, a serious cybersecurity threat. Covert data theft often occurs through malware injection attacks, where malicious code is injected into a system to secretly exfiltrate sensitive data. These attacks are particularly dangerous as they are stealthy and can evade traditional security measures, leading to unauthorized access to valuable information. Existing systems primarily address either malware detection or data backup separately, failing to offer a holistic approach to protect sensitive data from such covert attacks. To address these limitations, this project proposes an integrated security solution that combines Deep Neural Networks (DNNs) for detecting malware injection attacks, Cloud Conceal as a secure backup and recovery system, and Data Masking using Tokenization to protect sensitive information stored on USB drives. The DNN model detects suspicious system activities such as file access and process creation by analyzing features like API calls, byte sequences, and system log metadata. Once a malware attack is identified, sensitive data is swiftly transferred to Cloud Conceal, a secure backup system that creates encrypted copies of the data and allows for recovery in case of data loss or breach. In addition, Data Masking using Tokenization obfuscates sensitive information on USB drives, replacing original data with tokens, ensuring that unauthorized users cannot access the actual content. This integrated proposed system provides a framework for preventing covert data theft, enhancing the security of sensitive data, and ensuring its availability and integrity.

*ICSICA-2025-70*

## **EDGE COMPUTING IN THE IOE ECOSYSTEM BRIDGING THE GAP BETWEEN DATA GENERATION AND PROCESSING**

**C. Arunthathi**

Assistant Professor in Computer Applications  
Srinivasan College of Arts & Science, Perambalur  
arunthathi.scas@gmail.com

### **ABSTRACT**

The rapid advancement of the Internet of Things (IoT) has led to a surge in the number of smart devices connected to the internet. This growth results in vast amounts of data, creating challenges such as increased bandwidth consumption, slower response times, compromised security, and privacy issues within traditional cloud computing models. Conventional cloud computing is no longer sufficient to meet the diverse demands of modern intelligent societies for efficient data processing. This limitation has given rise to edge computing technologies a novel computing framework designed to process data at the network's edge. Unlike traditional cloud computing, edge computing is user-centric and operates closer to data sources. It is optimized for lightweight, localized data storage and processing, making it suitable for small-scale applications at the network's periphery. Over the past few decades, cloud computing has seen significant growth due to its cost-efficiency and flexibility, achieved through centralized management of computing, storage, and network functions. However, the rapid expansion of mobile internet and IoT applications has presented significant challenges to this centralized architecture. Mobile devices that rely on distant cloud servers for complex applications place additional strain on Radio Access Networks (RANs) and backhaul networks, leading to increased latency.

**Keywords:** Bandwidth consumption, Radio Access Networks (RANs), The rapid expansion of mobile internet.

*ICSICA-2025-71*

## **MACHINE LEARNING-BASED PREDICTION AND DETECTION OF CYBERSECURITY BREACHES**

**A. Kumudham**

Assistant Professor in Computer Science

Srinivasan College of Arts & Science, Perambalur

arunthathi.scas@gmail.com

### **ABSTRACT**

As cyber threats continue to evolve in complexity and scale, traditional security systems are often inadequate in identifying and mitigating hacking attempts in real time. This project presents a machine learning-based approach for the prediction and detection of cyber hacking breaches. By analyzing historical attack data and network behavior patterns, the system uses supervised and unsupervised learning algorithms to identify anomalies that may indicate potential breaches. Techniques such as decision trees, random forests, and neural networks are applied to enhance detection accuracy and reduce false positives. The proposed system continuously learns from new data, allowing it to adapt to emerging threats and provide early warnings. This intelligent and proactive method not only improves response time but also strengthens overall cybersecurity posture, making it a vital tool for modern digital defense systems.

*ICSICA-2025-72*

## **DEEP LEARNING-BASED DETECTION OF CEREBROVASCULAR ACCIDENTS FROM MEDICAL IMAGING**

**Mr. Anandan**

Bachelor of Computer Science and Engineering,  
VELS Institute of Science Technology and Advance Studies- Chennai

**K J Arjun, A Gaurav Tiwari, M Surya**

Bachelor of Computer Science and Engineering,  
VELS Institute of Science Technology and Advance Studies- Chennai  
arjunchetty2003@gmail.com

### **ABSTRACT**

Stroke remains a leading cause of mortality and long-term disability, emphasizing the need for timely and accurate diagnostic methods. This study presents an AI-driven stroke detection system utilizing the VGG16 convolutional neural network (CNN) to classify brain scan images. The input images undergo preprocessing steps including resizing and normalization to ensure consistency and enhance model performance. The trained model outputs both prediction labels and associated confidence scores, providing reliable decision support to healthcare professionals and minimizing diagnostic errors. To enhance accessibility and real-time usability, a web-based user interface has been developed, allowing users to upload brain images and receive immediate predictions. This integration of deep learning with an intuitive front-end interface aims to improve the speed, accuracy, and reach of stroke diagnosis, especially in critical care or resource-limited environments. Experimental results demonstrate high classification accuracy, highlighting the model's potential as a supportive tool in clinical diagnostics.

**Keywords:** Stroke detection, deep learning, VGG16, convolutional neural networks, brain scan classification, medical imaging, healthcare AI, diagnostic automation, real-time prediction.

*ICSICA-2025-73*

## **ENHANCED MACHINE LEARNING TECHNIQUES FOR HANDLING THE CHALLENGES OF IRRELEVANT TRAINING DATA**

**G. Archana**

Research Scholar, PG & Research Department of Computer Science,  
Government Arts College (Grade-I),(Affiliated to Bharathidasan University) Ariyalur 621 713,  
archana.scasca@gmail.com

**Dr. Vijayalakshmi**

Associate Professor, PG & Research Department of Computer Science, Government Arts  
College(Grade-I),(Affiliated to Bharathidasan University) Ariyalur 621 713,  
v.viji08@yahoo.co.in

### **ABSTRACT**

Irrelevant training data is another challenge in machine learning. Irrelevant training data means to data that is not valuable or revealing for the task at hand. Including irrelevant data in the training dataset can amplify the density of the copy and build it extra complex to discover the significant patterns and relationships in the data. In this paper will address the confront of irrelevant training data, researchers and practitioners are explore techniques such as feature selection, feature extraction, and domain knowledge. Feature selection involve select only the majority relevant features from the dataset and clearance the irrelevant features. Feature extraction involves transform the untreated data into a new instructive sign that capture the appropriate pattern and relationships in the data. Domain knowledge involves incorporating authority facts about the undertaking at pass to funnel the collection of features or the design of the machine learning model. These techniques can facilitate decrease the collision of irrelevant data on the recital of machine learning models and get better their exactness and effectiveness.

**Keywords:** Feature Selection, Feature Extraction, Collision, Training Dataset.

*ICSICA-2025-74*

## **AI-POWERED GRIEVANCE REDRESSAL AND RECOMMENDATION SYSTEM**

**V.Kiruthika, S.Janani, V.Kiruthika, S.Vaishnavi.**

AVS Engineering College, Salem.

### **ABSTRACT**

AI-powered tool for analyzing and managing petitions efficiently. It leverages NLP and ML to process grievances. The system enhances accuracy and speed. Uses Natural Language Processing (NLP) and Machine Learning (ML) for classification. These techniques help in understanding petition content. Proper classification leads to faster resolution. Categorizes grievances into relevant departments automatically. This reduces manual effort and improves response time. Proper categorization ensures the right department handles the issue. Flags urgent and important cases for priority resolution. Sentiment analysis helps in identifying urgency. Officials can address critical issues first. Identifies and consolidates repetitive grievances. Machine learning detects duplicate complaints. This avoids redundancy and saves time. Sends automated reminders to officials for pending issues. Notifications ensure timely follow ups. Delayed cases receive priority alerts. Provides real-time status updates to petitioners for transparency. Users can track their grievances easily. Transparency builds public trust.

*ICSICA-2025-75*

## **INFINITE STORAGE GLITCH WITH USING COMPRESSION METHOD**

**Vijaya Kumar S, Pradeep A, Lingeshwar A, Maheshwaran R**

K.Ramakrishnan College of Engineering. Trichy.

### **ABSTRACT**

Converting files into binary code involves encoding the data into a sequence of 0s and 1s. This binary representation allows for efficient storage, transmission, and processing of data in computer systems. By converting files into binary code, the data can be represented in a compact form, reducing storage requirements and enabling faster transmission over networks. Converting files into binary code can enhance data security. Encryption algorithms often utilize binary encoding as a foundation for encrypting sensitive information, making it more resistant to unauthorized access or breaches. However, working directly with binary code can be complex and challenging for humans. Hence, higher-level programming languages and file formats provide abstractions and tools that enable easier manipulation and interpretation of binary data. In conclusion, converting files into binary code is a vital process in modern computing. It offers advantages such as compact representation, efficient storage and transmission, compatibility with digital systems, improved data security, and integration with software applications. As technology advances, further research and development in this field can lead to optimizations and innovations in data representation, storage, and processing.

*ICSICA-2025-76*

## **AI-POWERED DEEPPAKE DETECTION: A DEEP LEARNING – BASED FRAMEWORK FOR FAKE MEDIA IDENTIFICATION**

**Sridharshini P T, Sowmiya R Evelyn Devapriya S, Karthika S.**

AVS Engineering College, Salem.

### **ABSTRACT**

The rapid advancement of artificial intelligence (AI) and cloud computing has led to the proliferation of sophisticated audio, video, and image manipulation techniques, collectively known as deepfakes. These manipulated media content pose significant threats to democratic discourse, electoral integrity, institutional credibility, journalism, and social cohesion, with far-reaching consequences for individuals, communities, and societies. The increasing sophistication of deepfake technologies has rendered manual detection methods ineffective, emphasizing the need for automated detection solutions. To address this challenge, we propose a novel Deep Learning Binary Classifier for detecting deepfake videos. Our model, comprising a convolutional neural network (CNN) and long short-term memory (LSTM) architecture, is trained on the Deepfake Detection Challenge dataset, a comprehensive repository of manipulated and authentic video content. Through extensive experiments, our best model achieves an accuracy score of 96.63%, demonstrating its effectiveness in distinguishing between authentic and manipulated video content. A comprehensive evaluation of our model's performance reveals its robustness, reliability, and generalizability, making it a valuable tool for detecting deepfakes in real-world applications. We also conduct an ablation study to investigate the contributions of different components of our model, providing insights into the importance of each component in detecting deepfakes. Furthermore, we discuss the potential applications of our model in various domains, including social media, journalism, and law enforcement.

**Keywords:** Deepfake Detection, Deep Learning, Binary Classifier, Convolutional Neural Network (CNN), Long Short-Term Memory (LSTM), Digital Media Authentication, Online Trust, Social Media, Journalism, Law Enforcement

*ICSICA-2025-77*

## **QUALITY ENHANCEMENT OF RETINAL IMAGE USING CONTRAST STRETCHING**

**S. Kavibharathi**

Assistant Professor, Department of CS, IT and AI & ML  
Srinivasan College of Arts & Science, Perambalur

### **ABSTRACT**

Real time fundus images captured to detect multiple diseases are prone to different quality issues like illumination, noise, etc. resulting in less visibility of anomalies. So the enhancement technique plays an important role in providing quality images for other processes. In this project, to enhance the images which include gray scale conversion, noise removal using Median filter and contrast enhancement using contrast stretching techniques. The performance of the proposed method to evaluate using PSNR, MSE and SSIM. The project utilizes the two retinal image datasets, which consists of two types of disease images: Glaucoma, Cataract images. The images collected from DRIVE and MESSIDOR datasets. The project work implemented using the PYTHON software with Google Collaboratory.

*ICSICA-2025-78*

## **COVID-19 CLASSIFICATION USING CONVOLUTIONAL NEURAL NETWORK**

**P. Banumathi**

Assistant Professor, Department of CS, IT and AI & ML  
Srinivasan College of Arts & Science, Perambalur

### **ABSTRACT**

Applying machine learning on medical data is very challenging and crucial task. Covid-19 (coronavirus disease 2019) is a disease caused by a virus named SARS-coV-2. The total number of COVID-19 confirmed cases in India was 30,411,634, and the death toll climbed to 399,459 as of 30 June 2021, whereas the total cases and fatalities were merely 585,481 and 17,400, respectively. The project applied the Convolution Neural Network (CNN) algorithm for COVID-19 classification. The project is tested on the publicly available Computed Tomography (CT) images. The performance of model is classify image Covid or NonCovid. If the covid-19 is present it returns positive otherwise return negative. The project is Implemented using PYTHON3 on Google Colab with T4 GPU. The proposed method achieved an average accuracy of 82%.

*ICSICA-2025-79*

## **AUTOMATIC METHODS TO PROVIDE AN EFFECTIVE CLOUD COMPUTING DATA REPLICATION STORAGE**

**M. Rajakumar**<sup>1,2</sup>

<sup>1</sup> Head, Department Computer Applications,  
Srinivasan College of Arts and Science,  
Perambalur,  
Affiliated to Bharathidasan University, Trichy.

<sup>2</sup> Research Scholar,  
Sri Ramakrishna College of Arts & Science (A),  
Affiliated to Bharathiar University, Coimbatore.  
rajkumarpblr2017@gmail.com

### **ABSTRACT**

Content dispersion networks have received a lot of attention lately. One of the key breakthroughs of content distribution companies, Area-Based Replication (RPP), has received a lot of thought. In several geologically dispersed server farms, Internet providers are served. The server farm's location directly affects working costs, capital, and administrative response time. It is essential for both cloud specialist firms and clients to continuously increase the consumption rate of distributed storage, giving executives the quickest possible opportunity to respond to customer needs and geographic constraints. By reducing information accessibility, information replication typically reduces record access time. In order to reduce information replication, this article suggests the concept of ODRA (Optimal Dynamic Replication Algorithm). ODRA's core concept is to improve the server's consistent quality while reducing information duplication on the server. It helps to successfully reduce indexed lists in a short amount of time by decreasing server idleness and data transmission use, among other things. The indexed lists' request for document supply determines this. On many servers, the placement value can be ascertained. Copy records are treated as copy documents stored on two servers by low-level documents. Furthermore, it is noteworthy that there are a lot of waiters in distributed computing frameworks.

**Keywords:** Cloud Computing, Popularity Degree, Distribution Networks, Data Replication.

*ICSICA-2025-80*

## **DYNAMIC PRICING STRATEGY IN RETAILS STORES USING RNN**

**A. Akilan**

Assistant Professor, Department of Computer Science,  
Srinivasan College of Arts & Science, Perambalur.

### **ABSTRACT**

In the evolving landscape of retail and e-commerce, implementing an effective pricing strategy is crucial for enhancing profitability and ensuring customer satisfaction. Leveraging the advancements in machine learning, this paper introduces a dynamic pricing model utilizing Recurrent Neural Networks (RNNs) tailored for retail environments. This innovative approach diverges from conventional pricing mechanisms by enabling real-time price adjustments that account for varying factors such as market demand, competitor pricing strategies, and consumer behaviors. Our model harnesses supervised learning techniques to analyze historical sales data, thereby predicting the most advantageous pricing points to optimize revenue and enhance customer engagement. Empirical results demonstrate that our RNN-based model substantially outperforms traditional pricing strategies, offering retailers a significant competitive advantage by allowing them to adapt quickly to market changes and evolving consumer preferences.

**Keywords:** Dynamic Pricing Strategy, Machine Learning, Retail E-commerce, Recurrent Neural Networks (RNN,) Supervised Learning, Real-Time Price Adjustment, Market Demand Analysis, Competitor Pricing, Consumer Behaviour and Revenue Optimization.

*ICSICA-2025-81*

**A SITUATION BASED PREDICTIVE APPROACH FOR  
CYBERSECURITY INTRUSION DETECTION AND PREVENTION  
USING MACHINE LEARNING AND DEEP LEARNING  
ALGORITHMS IN WIRELESS SENSOR NETWORKS OF INDUSTRY  
4.0**

**S. Dharaniypriya, Thanigaivel**

Krishnasamy College of Engineering and Technology, Cuddalore.

sdharaniypriya@gmail.com

**ABSTRACT**

Industry 4.0 is fundamentally based on networked systems. Real-time communication between machines, sensors, devices, and people makes it easier to transmit the data needed to make decisions. Informed decision-making is empowered by the comprehensive insights and analytics made possible by this connectedness in conjunction with information transparency. Industry 4.0-based wireless sensor networks (WSNs) are an integral part of modern industrial operations however, these networks face escalating cyber security threats. These networks are always vulnerable to cyber-attacks as they continuously collect data and optimize processes. Increased connections make people more susceptible to cyber-attacks, necessitating the use of strong cybersecurity measures to protect sensitive data. This study proposes a predictive framework intended to intelligently prioritize and prevent cybersecurity intrusions on WSNs in Industry 4.0. The proposed framework enhances the cybersecurity of WSNs in Industry 4.0 using a multi-criteria approach. It implements machine-learning and deep learning algorithms for cybersecurity intrusion detection in WSNs of Industry 4.0 and provides prevention by assigning priorities to the threats based on the situation and nature of the attacks. We implemented three models, i.e., Decision Tree, MLP, and Autoencoder, as proposed algorithms in the framework. For multidimensional classification and detection of cybersecurity intrusions, we implemented Decision Tree and MLP models.

**Keywords:** Cybersecurity, WSN, detection, prediction, intrusions, machine learning and deep learning.

*ICSICA-2025-82*

## INTELLIGENT AGENT BASE AUDITING FORCE PUBLIC KEY INFRASTRUCTURE SYSTEM

**S. Satheeshkumar**

Assistant Professor, Department of Information Technology,  
Vivekanandha College of Technology for Women, Tiruchengode.  
satheestech@gmail.com

**R.Swetha**

Department of Information Technology,  
Vivekanandha College of Technology for Women, Tiruchengode.  
sweethait2003@gmail.com

### ABSTRACT

Public Key Infrastructure (PKI) plays a critical role in securing digital communications by providing mechanisms for encryption, authentication, and digital certificate management. However, traditional PKI systems often face challenges related to certificate misuse, lack of real-time monitoring, and limited adaptability in dynamic network environments. This paper proposes an intelligent agent-based auditing framework to enhance the security and reliability of PKI systems. The proposed approach integrates autonomous software agents capable of real-time monitoring, anomaly detection, and adaptive decision-making within the PKI lifecycle. These intelligent agents analyze certificate usage patterns, detect potential security breaches, and initiate automated responses such as certificate revocation or alert generation. By incorporating machine learning and rule-based techniques, the system ensures efficient audit trails, policy enforcement, and proactive threat mitigation. The proposed architecture demonstrates improved auditing efficiency, scalability, and resilience against evolving cyber threats, offering a novel direction for secure digital infrastructure management. Experimental results and simulations validate the effectiveness of the intelligent agent framework in enhancing PKI security while minimizing administrative overhead.

**Keywords:** Security, Public Key Infrastructure, PKI Validation, Cyber Security.

*ICSICA-2025-83*

## **HACKING THE HUMAN: THE PSYCHOLOGY BEHIND SOCIAL ENGINEERING ATTACKS**

**R. Rajalakshmi**

Assistant Professor, Department of Cyber Security,  
Paavai Engineering College, Namakkal, rajalaksmisk@gmail.com.

**Baraninishanth P, Gokul Raj M, Gurukishore T**

Department of Cyber Security, Paavai Engineering College, Namakkal,  
nishanthbarani55@gmail.com.

### **ABSTRACT**

Social engineering represents one of the most formidable threats in modern cybersecurity, not because of technological sophistication, but due to its exploitation of human psychology. Unlike traditional cyberattacks that target software vulnerabilities, social engineering attacks rely on deception, emotional manipulation, and trust-building to compromise individuals and organizations. By manipulating cognitive biases, emotional responses, and behavioral tendencies, attackers are able to bypass security protocols and gain unauthorized access to sensitive information. This paper explores the psychological underpinnings that make social engineering so effective, including the roles of authority, reciprocity, fear, and social proof. It also examines a range of social engineering tactics from phishing and pretexting to deepfake-enabled impersonation and provides real-world case studies to demonstrate their impact. In addition, the paper analyzes emerging trends such as AI-driven social manipulation, discusses the ethical and legal challenges in both offensive and defensive applications, and proposes advanced mitigation strategies. By understanding the human factors at the heart of these attacks, cybersecurity professionals can better equip themselves to anticipate, detect, and counteract social engineering threats.

**Keywords:** Social engineering, cybersecurity, human psychology, cognitive biases, AI-driven attacks.

*ICSICA-2025-84*

## **HYPERPART: A HYPERGRAPH BASED ABSTRACTION FOR DEDUPLICATED STORAGE SYSTEM**

**C. Varsha**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous)perambalur-621212  
varshasekaren29@gmail.com

**P. Varshini**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous)perambalur-621212  
pvarshinibca@gmil.com

### **ABSTRACT**

HYPERPART is an innovative framework designed to enhance the efficiency of deduplicated storage systems by using a hypergraph-based abstraction. In traditional deduplication systems, data is typically divided into smaller chunks, and redundant chunks are eliminated to save storage space. However, these systems often face challenges in efficiently managing the relationships between chunks and ensuring optimal data retrieval. This is where HYPERPART comes in by utilizing hypergraphs, it redefines how relationships between chunks are represented, leading to significant improvements in storage efficiency and retrieval performance. A hypergraph is a generalization of a graph where an edge, called a hyperedge, can connect more than two vertices. In the case of HYPERPART, the vertices represent data chunks, and the hyperedges represent complex relationships or dependencies between those chunks. For example, in a file system, a single file may consist of multiple chunks, and these chunks may overlap with chunks in other files.

*ICSICA-2025-85*

## **PREDICTION OF HEART DISEASE USING MACHINE LEARNING ALGORITHMS**

**A. Akash**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous)perambalur-621212  
akash@1920034@gmail.com

**R. Govindasamy**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous)perambalur-621212  
ggnavaneeth@gmail.com

### **ABSTRACT**

Heart disease is a leading cause of morbidity and mortality worldwide. Early detection and diagnosis are critical to improving patient outcomes and reducing healthcare burdens. Machine learning techniques provide powerful tools for analyzing complex medical datasets and predicting heart disease with high accuracy. This study explores the application of various machine learning algorithms, including Logistic Regression, Random Forest, Support Vector Machines (SVM), and Gradient Boosting models, to predict the presence of heart disease based on clinical features such as age, blood pressure, cholesterol levels, and exercise-induced angina. The dataset is preprocessed through data normalization, categorical encoding, and feature selection to enhance model performance. Models are trained, validated, and evaluated using performance metrics such as accuracy, precision, recall, F1-score, and ROC-AUC. Results indicate that ensemble methods like Random Forest and Gradient Boosting outperform traditional algorithms in terms of accuracy and robustness. This research highlights the potential of machine learning in supporting clinical decision-making and emphasizes the importance of data-driven approaches in modern healthcare.

*ICSICA-2025-86*

## **FIR SYSTEM USING BLOCK CHAIN TECHNOLOGY**

**P. Poovarasan**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous)perambalur,621212  
poovarasanpoomalai108@gmail.com

**A. Kalpana**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous)perambalur,621212  
Kalpanaanbarasan23@gmail.com

### **ABSTRACT**

Crime Records are exists in Police Stations. Crime Records are enable to find crimes and their involved criminals. In the existing system they are using a FIR for maintain the crime and criminal details. It contain a less security and easy to perform fraud. The record has been updated manually every time. The main objective of this system is providing security to data by using Block chain technology. Using their authentication credentials, Crime Investigators can view the data form database. The reports, which are prepared by witnesses and police officers, are accessible to the investigator (writer). Investigators have the authority to edit data (i.e., update, remove, and so on), and this data aids investigators in speeding up their investigations and identifying offenders more quickly. Previous research has focused on the centralised handling of digital evidence, however if a centralised system server is breached, sensitive operational and investigation data may be exposed. As a result, there is a need to manage digital evidence and investigative information in a distributed system setting using block chain technology. When vast volumes of data, such as evidentiary videos, are stored in a block chain, the amount of data that must be processed only once before being created increases, resulting in performance reduction. As a result, we suggest a three-tier block chain architecture, with hot and cold block chains for digital evidence. Information that changes regularly is stored on the hot block chain, whereas material that does not change, such as files, is saved in the cold block chain.

*ICSICA-2025-87*

## DEEP LEARNING BASED PLANT DISEASE DETECTION AND ALGORITHM CATEGORIZATION

**A. Suviga**

Assistant Professor, Department of CSE  
Dhanalakshmi Srinivasan Engineering College (A), Perambalur

### ABSTRACT

Tree health is essential for ecological balance and ecosystem diversity. Early detection of diseases that affect tree leaves can help with timely intervention and mitigation efforts. The goal of this study is to determine if tree leaves in high-resolution photos are healthy or suffering from a particular disease. It offers a novel deep learning-based method for predicting tree diseases, namely the VGG16 convolution neural network architecture. The procedure entails gathering a substantial collection of images of tree leaves from various species and disease types. To improve the model's resilience and generalization, data preparation techniques such as photo resizing, normalization, and augmentation are used. The top layers of the pre-trained VGG16 model are tailored for the task of feature extraction. To improve its performance, the proposed model is put through a thorough training and validation process. Accuracy, precision, recall, and F1 score are among the metrics used to assess the model's illness classification performance. The project's goal is to develop a reliable and efficient tool that will help arborists, foresters, and environmentalists identify and address tree-related issues quickly. The study's findings provide an automated and scalable approach to early tree disease detection, advancing precision agriculture and environmental monitoring. In order to encourage sustainable practices for the preservation of global ecosystems, the study also looks at potential real-world applications. Furthermore, broaden the framework to provide fertilizer information based on predicted disease.

**Keywords:** Agriculture, Tree leaf-based disease prediction, Model selection, Deep learning, Fertilizer recommendation.

*ICSICA-2025-88*

## STUDENTS MATERIAL PORTAL

**A. Selvakumar**

Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212  
selvakumararu1820@gmail.com

**A. Kalpana**

Assistant Professor, Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212  
kalpanaanbarasan23@gmail.com

### ABSTRACT

In the evolving landscape of digital education, the need for efficient academic resource management has become essential. The Student Material Portal is a web-based platform developed using ASP.NET Core and MySQL to facilitate centralized access to learning materials such as notes, assignments, and lecture slides. Designed with role-based access control and a user-friendly interface, the system ensures secure document uploading by faculty and convenient material retrieval by students. It also features document tracking, departmental categorization, and dashboard analytics to enhance academic engagement. This project aims to streamline the distribution of educational content while ensuring scalability, usability, and security for institutional deployment.

**Keywords:** Student Portal, ASP.NET Core, Academic Resource Management, MySQL, Role-Based Access Control, E-learning, Document Tracking

*ICSICA-2025-89*

## **SECURE AND EFFICIENT DATA DEDUPLICATION ON CLOUD**

**P. Varshini, M. Abzana Begum**

Assistant Professor, Master of Computer Applications

Dhanalakshmi Srinivasan Engineering College (A), Perambalur

pvarshinibca@gmail.com, abzanabegum@gmail.com

### **ABSTRACT**

Commercial cloud storage providers have embraced the data deduplication technique, which is crucial and required to handle the rapidly expanding amount of data. Many secure data deduplication schemes are designed to further protect users' sensitive data in the outsourced storage mode. and used in a variety of contexts. Many academics were interested in these schemes because they offered secure and effective re-encryption for encrypted data deduplication, and numerous solutions were created to facilitate dynamic ownership management. In this paper, we focus on the re-encryption de duplication storage system and demonstrate that the recently developed lightweight encrypted de duplication scheme that is aware of rekeying is vulnerable to an attack that we refer to as the stub-reserved attack. The most significant and famous cloud administration is information stockpiling. To save the security of information holders, information are many times put away in cloud in an encoded structure. Scrambled information present new difficulties for cloud information deduplication, which becomes essential for huge information stockpiling and handling in cloud. Customary deduplication plans can't chip away at scrambled information.

**Keywords:** Data Deduplication, Cloud Computing, Conditional proxy re-encryption (CPRE), Cloud Service Provider (CSP)

*ICSICA-2025- 90*

## OPTIMIZING KNEE OSTEOPOROSIS DETECTION WITH CNNs AND YOLOV11

**V. Gokulakrishnan**

Research Scholar, Department of Computer Science and Engineering,  
Dhanalakshmi Srinivasan University, Tiruchirappalli, Tamilnadu  
gokulakrishnanv.phd2022@dsuniversity.ac.in

**Dr. S. Selvakumar**

Professor, Department of Computer Science and Engineering,  
Dhanalakshmi Srinivasan University, Tiruchirappalli, Tamilnadu  
ssksri@gmail.com

### **ABSTRACT**

A skeletal condition known as knee osteoporosis (KOP) is defined by low bone density and bone tissue deterioration, which increases the risk of bone fractures in the knee region. Knee radiography, which calls for specific knowledge, is the method used traditionally to identify osteoporosis in the knee. However, experts may misread X-ray images because to their large volume and small differences. Deep learning methods have significantly enhanced medical diagnosis in recent years by decreasing misclassification and helping radiologists make more precise evaluations. In particular, the capacity of YOLO (You Only Look Once), a cutting-edge object identification method, to rapidly and precisely identify regions of interest in images has led to its effective application for a variety of medical image analysis applications. The improved YOLO algorithm, known as YOLOv11, offers high-speed and high-accuracy detection, making it appropriate for real-time applications, particularly in the medical industry where prompt diagnosis is essential. YOLO is a great option for identifying the subtle patterns linked to osteoporosis in the knee because of its innate capacity to effectively identify important aspects in photos

**Keywords:** Knee Osteoporosis (KOP), YOLOv11, Object Detection, Deep Learning, Convolutional Neural Networks (CNN), Medical Image Analysis, X-ray Imaging, Ensemble Learning, Weighted Ensemble Approach, Real Time Detection, Bone Density, Osteoporosis Detection, Automated Diagnosis, Computer Aided Diagnosis (CAD), Image Classification.

*ICSICA-2025-91*

## **SECURITY AND PRIVACY IN INTELLIGENT TRANSPORTATION SYSTEMS: CHALLENGES, TRENDS, AND FUTURE DIRECTIONS**

**R. Govindasamy**

Assistant Professor, Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur  
ggnavaneeth@gmail.com

### **ABSTRACT**

The rapid evolution of Intelligent Transportation Systems (ITS) has revolutionized urban mobility, enabling enhanced traffic management, safety, and operational efficiency. Leveraging advanced technologies such as big data analytics, blockchain, and vehicular ad hoc networks (VANETs), ITS is transforming the way transportation networks operate. However, this digital transformation comes with significant security and privacy challenges. The extensive use of interconnected devices and data-intensive operations increases the risk of cyberattacks, unauthorized data access, and identity theft. This review provides a comprehensive synthesis of recent research addressing these challenges, highlighting critical vulnerabilities in ITS infrastructures and exploring state-of-the-art solutions. Key areas of focus include blockchain-based frameworks for secure and privacy-preserving transactions, cryptographic authentication models, and big data analytics for threat detection and mitigation. The paper also examines the role of artificial intelligence in real-time breach detection and response systems. By identifying current trends and evaluating the efficacy of existing approaches, this review underscores the pressing need for scalable, interoperable, and ethically sound solutions in ITS security and privacy.

**Keywords:** Intelligent Transportation Systems (ITS), Security, Privacy, Blockchain, Vehicular Ad hoc Networks (VANETs), Big Data Analytics, Artificial Intelligence, Cryptography.

*ICSICA-2025-92*

## DEEP LEARNING USING DATA FUSION FOR NON-INVASIVE DIABETES PREDICTION

**S. Jayapradha**

Research Scholar,

Dhanalakshmi Srinivasan Engineering College (A), Perambalur

### ABSTRACT

This research describes a deep learning-based strategy for non-invasive diabetes prediction that employs data fusion. Heart rate, blood pressure, body mass index, and other physiological and biometric information are combined using sophisticated data fusion algorithms. The proposed design combines long short-term memory (LSTM) networks for time-based analysis with convolution neural networks (CNN) for feature extraction. The framework has the potential to be used for early and non-invasive diabetes screening, as evidenced by experimental results showing better prediction accuracy than current techniques.

**Keywords:** Deep Learning, Data Fusion, LSTM, CNN, Non-invasive approach, Prediction Accuracy

*ICSICA-2025-93*

## **SDN+K8S ROUTING OPTIMIZATION STRATEGY IN 5G CLOUD EDGE COLLABORATION SCENARIO**

**A. Kavinkumar**

Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur,621212,  
kavinkuma28@gmail.com

**R. Gayathri**

Assistant Professor, Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur,621212,  
gaukrishna@gmail.com

### **ABSTRACT**

The cloud-edge-collaboration framework in the 5G scenario emerged as the times developing. The horizontal and vertical disassembly of computing power, this paper is particularly important, relying on the full life cycle resource allocation and flexible configuration of SDN+K8s+microservice. This paper proposes a new cloud native architecture form under the 5G cloud edge collaboration scenario. At the same time, it optimizes the SDN routing strategy at multiple levels, decouples and integrates context boundaries with the micro service servicemesh at multiple levels. For the underlying computing The paper and network form, it performs multi threshold detection and global route optimization based on k8s + Sdn. Experiments prove the stability and reliability of the 5G + cloud edge collaboration architecture and the progressiveness of route optimization.

**Keywords:** 5G,SDN,K8s, service mesh, microservice, Algorithm optimization, Route optimization strategy

*ICSICA-2025-94*

**AN AUTOMATED SYSTEM TO LIMIT COVID-19 USING FACIAL MASK  
DETECTION AND FACE RECOGNITION SYSTEM USING DEEP NEURAL  
NETWORK**

**N. Anbarasi**

Assistant Professor, Department of AI&DS

Dhanalakshmi Srinivasan Engineering college (Autonomous), Perambalur

anbarasivignesh28@gmail.com

**ABSTRACT**

COVID-19 pandemic caused by novel coronavirus is ceaselessly spreading so far everywhere the planet. The impact of COVID-19 has been fallen on most sectors of development. The attention system goes through a crisis. several preventative measures are taken to scale back the unfold of this sickness wherever carrying a mask is one in all them. during this paper, we have a tendency to propose a system that limit the expansion of COVID-19 by checking out those that aren't carrying any facial mask in an exceedingly sensible town network wherever all the general public places area unit monitored with television system (CCTV) cameras. whereas someone while not a mask is detected, the corresponding authority is knowledgeable through town network. A deep learning design is trained on a dataset that consists of pictures of individuals with and while not masks collected from varied sources. The trained design achieved ninety 88% accuracy on identifying folks with and while not a facial mask for antecedently unseen check knowledge. it's hoped that our study would be a useful gizmo to scale back the unfold of this disease for several countries within the world. COVID-19 epidemic has fleetly discontinuous our regular lives poignant the international trade and movements. carrying a mask to guard one's face has become the new traditional. within the close to future, several public service suppliers can expect the purchasers to wear masks fittingly to partake of their services. Therefore, mask detection has become a important duty to help worldwide civilization.

**Keywords:** Deep learning, Facial Mask Detection, COVID-19, Deep Learning, Convolutional Neural Network

*ICSICA-2025-95*

## **AI POWERED VOICE ASSISTANTS IN CUSTOMER SERVICE**

**R. Surya**

Assistant Professor, Department of AI&DS

Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur

### **ABSTRACT**

Voice assistants have become an integral part of our daily lives, enabling natural and seamless interactions with technology. Recent advancements in natural language processing (NLP) have been fueled by Large Language Models (LLMs), such as GPT-3 and its successors. This research explores the application of LLMs in voice assistants to enhance their language understanding and response generation capabilities. The study presents a comprehensive literature review, analyzing existing research on LLMs in the context of voice assistants. Our research objectives aim to investigate the effectiveness of LLMs in understanding complex user queries and generating contextually relevant responses.

**Keywords :** GPT-3,LLMx

*ICSICA-2025-96*

## **ENHANCING TRUST IN ARTIFICIAL INTELLIGENCE: A HYBRID APPROACH FOR EXPLAINABLE AI MODELS**

**K. Suvitha**

Assistant Professor, Department of CSE,  
Dhanalakshmi Srinivasan Engineering College, Perambalur

### **ABSTRACT**

Artificial Intelligence (AI) has become an integral part of many industries, transforming how businesses operate and how people interact with technology. However, one of the significant barriers to the widespread adoption of AI is the lack of trust in its decision-making processes, especially in high-stakes fields such as healthcare, finance, and autonomous driving. Many AI systems, especially deep learning models, operate as “black boxes,” meaning their inner workings are not easily interpretable by humans. This lack of transparency raises concerns about accountability, fairness, and the ethical use of AI, hindering its full potential. To address this challenge, the concept of Explainable AI (XAI) has gained prominence. XAI aims to make AI decisions transparent and understandable to humans. However, existing approaches to explainability often present trade-offs between performance and interpretability. While simpler models like decision trees or linear regressions are interpretable, they may not capture the complex relationships needed for high performance tasks. On the other hand, complex models such as deep neural networks excel in performance but struggle with transparency. A hybrid approach for XAI aims to bridge this gap by integrating multiple techniques that combine the strengths of both interpretable and complex models. This approach combines model-specific methods (like decision trees) and post-hoc explanation techniques (like LIME or SHAP), allowing for a deeper understanding of AI decision-making. The hybrid approach also incorporates interactive visualization tools, allowing users to actively explore and interpret AI outputs. By doing so, it provides a more comprehensive explanation of the model's predictions, improving trust, accountability, and acceptance of AI systems.

*ICSICA-2025-97*

**IMPROVING HEALTHCARE DATA PROTECTION:  
BLOCKCHAIN PROTOCOLS FOR SECURE HEALTH  
RECORDS**

**M. Hemalatha,**

Assistant Professor, Department of CSE,  
Dhanalakshmi Srinivasan Engineering College, Perambalur

**ABSTRACT**

The traditional health record sharing system faces challenges in security, privacy, and efficient sharing. "Sec-Health" protocol, a blockchain-based solution, addresses these issues by integrating advanced cryptographic techniques. Its structured workflow includes setup, storage, sharing, and emergency access phases, ensuring controlled access and data integrity. Through blockchain and IPFS networks, users register securely in the setup phase. Health records are encrypted and stored in the blockchain network during storage.

*ICSICA-2025-98*

## **OPTIMIZING CROSS-LAYER DESIGN FOR ENHANCED PERFORMANCE IN WIRELESS NETWORKS**

**Dr. Shree K.V.M**

Assistant Professor, Department of AI&DS,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur

### **ABSTRACT**

The paper covers the concept of cross-layer design in wireless communication networks, specifically focusing on ARQ, AMC, and rate constraints. ARQ protocols are commonly used at the link layer to combat channel fading by retransmitting lost or erroneous packets. However, there are limitations to the effectiveness of ARQ, particularly when the number of retransmissions is fixed to optimize delay and buffer size. The relationship between ARQ, throughput, and the number of retransmissions is explored, suggesting that a balance must be struck for optimal performance. Additionally, AMC techniques, which adapt the transmission rate based on channel conditions, are also discussed. These schemes improve system throughput by dynamically adjusting modulation and coding schemes, taking into account the channel's variations over time. A challenge with AMC lies in the assumption of continuous data availability, which is not always the case in real-world systems with unpredictable data streams. In this paper, we discussed the cross-layer design under the various aspects and analyse the performance matrix in wireless networks. Rate constraints in streaming media systems are addressed, where the encoding must adapt to the network state. This paper discusses how rate-distortion optimization can be applied to video streaming, ensuring a balance between data rate and presentation quality.

*ICSICA-2025-99*

**CREDIT CARD FRAUD DETECTION USING MACHINE LEARNING:  
REAL-WORLD INSIGHTS AND RANDOM FOREST  
ACCURACY OPTIMIZATION**

**Shakira Banu L**

Assistant professor, Department of Artificial Intelligence and Data Science  
Dhanalakshmi Srinivasan Engineering college (Autonomous)

**ABSTRACT**

This Project is focused on credit card fraud detection in real world scenarios. Nowadays credit card frauds are drastically increasing in number as compared to earlier times. Criminals are using fake identity and various technologies to trap the users and get the money out of them. Therefore, it is very essential to find a solution to these types of frauds. In this proposed project we designed a model to detect the fraud activity in credit card transactions. This system can provide most of the important features required to detect illegal and illicit transactions. As technology changes constantly, it is becoming difficult to track the behavior and pattern of criminal transactions. To come up with the solution one can make use of technologies with the increase of machine learning, artificial intelligence and other relevant fields of information technology; it becomes feasible to automate this process and to save some of the intensive amounts of labor that is put into detecting credit card fraud. Initially, we will collect the credit card usage data-set by users and classify it as trained and testing dataset using a random forest algorithm and decision trees. Using this feasible algorithm, we can analyze the larger data- set and user provided current data-set. Then augment the accuracy of the result data. Proceeded with the application of processing of some of the attributes provided which can find affected fraud detection in viewing the graphical model of data visualization. The results are indicated concerning the best accuracy for Random Forest are unit 98.6% respectively.

**Keywords:** Credit Card Fraud Detection, Machine Learning, Artificial Intelligence, Random Forest Algorithm, Decision Trees, Fraudulent Transactions, Data Visualization.

*ICSICA-2025-100*

## DEEP LEARNING-BASED IMAGE PROCESSING FOR COTTON LEAF DISEASE AND ISSUE DIAGNOSIS

**S. Chinnadurai,**

Research Scholar, Dept of CSE,  
Dhanalakshmi Srinivasan University, Trichy.

**S. Selvakumar**

Professor, Dept of CSE,  
Dhanalakshmi Srinivasan University, Trichy.

### ABSTRACT

A vital part of the agricultural economy, cotton production is severely impacted by a number of illnesses that lower output and quality. To reduce losses, these diseases must be diagnosed accurately and promptly. Using image processing techniques, this work suggests a deep learning-based method for identifying and categorizing cotton leaf diseases. A sizable collection of photos of cotton leaves was collected, covering a range of disease types such as bacterial blight, leaf spot, and healthy leaves. Using Convolutional Neural Networks (CNNs) to extract features and classify images, excellent illness detection accuracy was attained. To improve the model's performance on small datasets, transfer learning and fine-tuning techniques were used. Edge computing was used to implement real-time disease diagnosis, allowing for on-site analysis with low latency.

**Keywords:** CNN, ResNet, VGG16, SHAP.

*ICSICA-2025-101*

## NUMEROUS TECHNICAL PATTERNS FOR APPLICATIONS ON THE WEB

**G. Arun**

Assistant Professor, Department of CSE

Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur.

### **ABSTRACT**

Despite mobile apps have risen surprisingly in the last decade, their creation approaches differ greatly from software programs due to their differences. The differences across each of these being applied categories are used to introduce the development of web apps approaches. The doctoral dissertation demonstrates a variety of development methods and methodologies that have been specifically suggested for web apps. Examples of methods to be utilized for developing applications for the internet methodologies include agile, oriented towards objects, UML-based, etc. Appendices support the thesis work by demonstrating the application of UML and Agile-based development of web apps methodologies.

**Keywords:** XP (Extreme Programming), UML (Unified Modeling Language), CORBA (Common Object Request Broker Architecture), XML (Extensible Markup Language)

*ICSICA-2025-102*

**EARLY DETECTION OF BONE MARROW LESION SEVERITY RELATED  
TO PROXIMAL TIBIAL ORIENTATION IN KNEE OSTEOARTHRITIS ON  
KNEE MRI**

**K. Murugeswari**

Assistant Professor, Department of AI&DS

Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur.

**ABSTRACT**

Bone marrow lesions (BML) are painful changes in sub-chondral bone which can be reliably identified on MRI and have been identified in patients suffering from hip OA and related conditions. Knee osteoarthritis is a condition where cartilage in knee degenerates, or breaks down. The present study aimed to investigate the effect of Tibial Plateau (TP) inclination and serum bone metabolic markers on BML in the general Japanese population with early knee osteoarthritis (EKO). Deep Learning is a machine learning technique that teaches computers to do what comes naturally to humans. A method called MobileVnet algorithm was used to training and implement data. A total of 441 female volunteers who participated in the Iwaki Health Promotion Project in 2017 were enrolled. Participants without radiographic abnormalities were divided into normal and EKO groups according to the Luyten's classification criteria for EKO. The medial proximal tibial angle (MPTA), growth plate-TP angle, and growth plate-medial tibial plateau (MTP) angle were measured on standing anteroposterior radiographs of the knees. BML severity was positively associated with proximal tibial inclination and serum TRACP-5b level in participants with EKO and normal knees, respectively. Assessment of proximal tibial inclination may provide insight into potential BML risk. Thus, the detection of bone marrow lesion severity associated with proximal tibial inclination in early knee osteoarthritis increased as 5 3% respectively.

**Keywords:** Medial proximal tibial angle, Bone marrow lesion, Early knee Osteoarthritis, Tibial Plateau, Growthplate

*ICSICA-2025-103*

## **PREDICTIVE FAULT DIAGNOSIS IN RAILWAY HVAC USING A HYBRID MODEL-BASED APPROACH**

**M. Palanisamy**

Assistant Professor, Department of AI&DS,  
Dhanalakshmi Srinivasan Engineering College, Perambalur  
ps875235@gmail.com

### **ABSTRACT**

Prognostics and health management (PHM) of systems rely on prior knowledge and sufficient condition monitoring (CM) data to accurately estimate the remaining useful life (RUL) of critical components. The failure of complex systems, such as heating, ventilation, and air conditioning (HVAC) systems in passenger trains, can have significant consequences for safety and environmental conditions. Due to strict regulations, components are often replaced early, leading to CM datasets that lack data on advanced degradation stages, making robust diagnostics and prognostics challenging. As a result, PHM is rarely implemented in HVAC systems. This paper presents a hybrid model-based approach (HyMA) to address the limitations of training datasets in prognostic model development. The methodology integrates a physics-based model with a deep learning algorithm to enhance prognostics. The physics-based model simulates run-to-failure data using real asset information and expert knowledge. Virtual sensors complement physical sensors to monitor component health. A deep convolutional neural network (CNN) is then used for RUL estimation. Experimental results demonstrate high accuracy, highlighting the potential of HyMA for PHM applications.

**Keywords:** Prognostics and health management, hybrid modelling, deep learning, HVAC system, railway.

*ICSICA-2025-104*

## **A MACHINE LEARNING APPROACH FOR SECURING IOT NETWORKS FROM BOTNET ATTACKS**

**S.Suganya**

Assistant Professor, Department of AI&DS,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur.

### **ABSTRACT**

The rapid expansion of the Internet of Things (IoT) has revolutionized many sectors by enhancing connectivity and automation. However, this proliferation has also introduced significant security vulnerabilities, particularly in relation to botnet-based attacks. Botnets, formed by networks of compromised devices, are increasingly being used to target IoT networks for malicious purposes such as Distributed Denial of Service (DDoS) attacks, data theft, and system disruptions. Traditional security mechanisms, like firewalls and signature-based intrusion detection systems (IDS), are often ineffective in IoT environments due to the heterogeneity and scale of the devices involved. This paper proposes a machine learning-based approach for securing IoT networks from botnet attacks. By leveraging both supervised and unsupervised learning techniques, the proposed system offers real-time detection, classification, and mitigation of botnet activities. Experimental results demonstrate the system's ability to effectively detect botnet behavior while maintaining low false-positive rates. The approach shows promise for enhancing IoT network security and mitigating the threat posed by botnet attacks. Keywords: IoT security, botnet attacks, machine learning, anomaly detection, DDoS, supervised learning, unsupervised learning.

*ICSICA-2025-105*

## **PRECISION AGRICULTURE ADVANCEMENTS: A COMPREHENSIVE INTEGRATED SYSTEM FOR DISEASE PREDICTION AND CROP YIELD ESTIMATION USING IMAGE ANALYSIS AND ENVIRONMENTAL DATA**

**R. Aarthy**

Assistant Professor, Department of AI&DS,  
Dhanalakshmi Srinivasan Engineering College, Perambalur.

### **ABSTRACT**

The primary problem facing agriculture, which is essential to ensuring the world's food security, is maximizing crop productivity while reducing the effects of plant diseases. Advanced technologies have the potential to completely transform agricultural methods, especially in the areas of computer vision and machine learning. This study uses meteorological datasets and fruit image analysis to create an integrated agricultural decision support system for crop yield estimation and disease prediction. By offering early plant disease detection and precise crop yield estimates, the system seeks to improve precision agriculture techniques. A variety of datasets with plant photos labelled with disease information are gathered for the study, and meteorological data is integrated to capture environmental variables. Advanced image processing techniques are included in the methodology to extract pertinent features from plant photos. In order to analyse and categorize photos and forecast the possibility of crop illnesses harming fruits, a Convolutional Neural Network (CNN) deep learning model is created. Suggest natural fertilizers based on the disease that is afflicted. The Multilayer Perceptron algorithm is used to train the model using a large dataset that contains historical meteorological data, allowing it to identify patterns and connections between environmental conditions. Lastly, farmers receive an SMS notice with prediction specifics.

**Keywords:** Precision agriculture, Disease prediction, Crop yield values, Deep learning, Neural network.

*ICSICA-2025-106*

## **REPEATED STORAGE DETECTION WITH SECURE DATA SHARING IN CLOUD COMPUTING**

**N. Punitha**

Assistant Professor, Department of AI&DS

Dhanalakshmi Srinivasan Engineering College, Perambalur

npuninambicse@gmail.com

### **ABSTRACT**

Cloud data storage has gained immense popularity in recent years due its scalability and accessibility. However, the efficient management of data in the cloud, especially with the ever-increasing volume of data, remains a significant challenge. Data deduplication is a crucial technique to reduce storage costs and enhance data management efficiency it also concerns the secure cloud data sharing storage and sharing. Here implements a novel approach to deduplication base cloud data storage using chunk-based partitioning. In this approach, data is divided into fixed size chunks, and a deduplication mechanism is applied to identified and eliminate redundant chunks. The process of duplicate detection leading to improved storage efficiency and reduce data redundancy. It not only conserves storage space but also enhance data retrieval performance by reducing the volume of data to be transferred over a network. Proposed system also enhance the security of cloud data storage by employing base 64 encoding for data representation and implementing re-encryption based on the Advanced Encryption Standard (AES) for secure data sharing. The base64 encoding methodology is employed to transform binary data into a text format, rendering it less susceptible to unintended manipulations during data transmission and storage. This encoding mechanism ensures data integrity and facilitates its secure storage in cloud environments. By utilizing AES encryption, data shared among users is re-encrypted with unique keys, ensuring at only authorized recipients can access and decrypt shared information. The proposed approach significantly enhances data confidentiality and mitigates risks associated with unauthorized access, there by fortifying the security of cloud-based data sharing.

**Keywords:** Cloud Computing, Client, Server, Owner, AES Encryption.

*ICSICA-2025-107*

## **IOT-BASED REAL-TIME GAS LEAK DETECTION ENHANCING SMART HOME SAFETY**

**T. Geetha**

Assistant Professor, Department of CSE

Dhanalakshmi Srinivasan Engineering College, Perambalur

**Aakash R, Adwaith S Chandran, Anantha Narayan, Hadhee Rahman**

Department of CSE

Dhanalakshmi Srinivasan Engineering College, Perambalur

### **ABSTRACT**

The Internet of Things (IoT) has revolutionized smart home security by enabling real-time monitoring and automation. One critical application is gas leak detection, which enhances safety by preventing hazardous incidents. This paper presents an IoT-based real-time gas leak detection system that continuously monitors indoor air quality using gas sensors, microcontrollers, and wireless communication. When a gas leak is detected, the system triggers alerts through mobile notifications, alarms, and automatic ventilation activation. Cloud-based data processing ensures remote accessibility and real-time analytics. The proposed solution improves response time, minimizes risks, and enhances smart home safety, making it an essential component of modern home automation.

*ICSICA-2025-108*

## **EMERGENCY VEHICLE OBJECT DETECTION FOR TRAFFIC LIGHT OPTIMIZATION**

**Dr. R. Gopi**

Professor & Head, Department of CSE,  
Dhanalakshmi Srinivasan Engineering College, Perambalur

**Nivetha S, Nivetha T, Keerthana K**

Department of CSE,  
Dhanalakshmi Srinivasan Engineering College, Perambalur

### **ABSTRACT**

Emergency response times are crucial for saving lives in urban environments, where traffic congestion can significantly delay the arrival of emergency vehicles. This paper presents an innovative approach to address this challenge through the development of an intelligent traffic light control system tailored for prioritizing the passage of emergency vehicles, with a focus on ambulances. The efficient movement of emergency vehicles through urban traffic is critical for saving lives and minimizing response times. This project proposes an intelligent traffic light control system designed to prioritize the passage of emergency vehicles, particularly ambulances, through intersections. The system utilizes a combination of computer vision technology, communication modules, and advanced control algorithms to detect approaching emergency vehicles, communicate with traffic light controllers, and adjust signal timings in real-time. The proposed system undergoes rigorous testing and optimization to ensure effectiveness and compliance with regulatory standards. Implementation of this intelligent traffic light control system has the potential to significantly improve emergency response times and enhance overall traffic management in urban environments. In this project we can develop the framework classify the ambulance vehicles and sound of emergency vehicles using Convolutional neural network algorithm. Experimental results shows that the proposed system provide improved accuracy rate than the existing machine learning algorithms.

*ICSICA-2025-109*

## **REAL-TIME SQL INJECTION ATTACK DETECTION IN NETWORK ENVIRONMENTS**

**M. Hemalatha**

Assistant Professor, Department of CSE,  
Dhanalakshmi Srinivasan Engineering College, Perambalur

**Roshan Kumar, Rupesh Kumar, Vikash Kumar**

Department of CSE,  
Dhanalakshmi Srinivasan Engineering College, Perambalur

### **ABSTRACT**

SQL Injection (SQLi) attacks remain a prevalent and dangerous threat to web-based applications, often leading to unauthorized data access, data breaches, and system compromise. As these attacks evolve in complexity and frequency, real-time detection within network environments has become critical to maintaining system security. This research presents a novel framework for the real-time detection of SQL Injection attacks by analyzing network traffic patterns and payload content. The proposed system leverages machine learning algorithms, including Decision Trees and Long Short-Term Memory (LSTM) networks, to identify anomalous query structures embedded in HTTP requests. Unlike traditional rule-based intrusion detection systems (IDS), our model adapts to new attack variants by continuously learning from traffic data. Network packets are parsed and inspected at the application layer to extract SQL related payloads, which are then evaluated for malicious intent. Experimental results on benchmark datasets demonstrate the system's high detection accuracy and low false positive rate, validating its effectiveness in dynamic and high-volume network environments. The proposed approach not only enhances early threat identification but also supports integration with existing intrusion prevention systems (IPS) for proactive defense. This research contributes to the advancement of intelligent, real-time security solutions for safeguarding modern web infrastructure.

*ICSICA-2025-110*

## **BREAST CANCER DETECTION USING HYBRID RI-VIT IN HISTOPATHOLOGICAL IMAGES**

**T. Geetha**

Assistant Professor, Department of CSE  
Dhanalakshmi Srinivasan Engineering College, Perambalur

**Lakshmi R , Karthiga S, Lashiya M, Preethi B**

Department of CSE  
Dhanalakshmi Srinivasan Engineering College, Perambalur

### **ABSTRACT**

Predicting breast cancer from histopathological datasets through deep learning methods represents a significant advancement in medical diagnosis, enabling healthcare professionals to accurately identify cancerous cells and provide timely treatment, thereby improving patient outcomes. The process commences with the collection of histopathological images of breast tissue samples, often obtained from biopsy slides, which are then meticulously annotated by experienced pathologists to indicate whether each sample is malignant or benign, providing a comprehensive understanding of the dataset. To ensure optimal performance, preprocessing steps such as resizing, normalization, and augmentation are applied to enhance dataset diversity and mitigate overfitting issues, thereby improving the model's ability to generalize to unseen data. A suitable deep learning architecture, typically a Convolutional Neural Network (CNN), is selected and trained on the dataset, with hyperparameters fine-tuned based on its performance on the validation set, ensuring that the model is optimized for accurate predictions. The model's performance is rigorously evaluated on the test set using various metrics, including accuracy, precision, recall, F1-score, and AUC-ROC, providing a comprehensive understanding of its strengths and weaknesses. Techniques such as feature importance, partial dependence plots, and SHAP values are employed to interpret the model's predictions and decision-making process, providing insights into which features are driving the model's predictions and how the model is using these features.

*ICSICA-2025-111*

## **HELMET-YOLO: A NEW METHOD FOR REAL-TIME, HIGH-PRECISION HELMET WEARING DETECTION**

**K.Ramya**

Assistant Professor, Department of CSE

Dhanalakshmi Srinivasan Engineering College, Perambalur

**Raghulkishore R, Gopi S, Mohamed Yasar K, Sekedharan S**

Department of CSE

Dhanalakshmi Srinivasan Engineering College, Perambalur

### **ABSTRACT**

In response to the problems of low target recognition accuracy and high latency of existing helmet wearing detection algorithms under conditions of target occlusion, small targets, and low light levels, this paper optimizes the VanillaNet-6 network and combines it with the YOLOv8s general object detection algorithm to propose a Helmet-YOLO helmet wearing detection algorithm. Firstly, a small-scale GhostConv is used at the input layer of the VanillaNet-6 network to extract more detailed information from the input images at low cost. Secondly, the VanillaODBlock is proposed to enhance the network model's focus on the current task target. Next, the spatial feature pyramid pooling structure is used to improve model computational efficiency. Lastly, the LSKBlock is added in the feature fusion network to enhance relevant background information that can serve as judgment basis in the features, thereby improving the model's robustness. The EIoU bounding box loss function is used to optimize the detection effect of occluded targets and accelerate model convergence. Experimental results show that the improved algorithm achieves a 96.7% mAP@0.5 with a reduction in computational volume by 32.4%, model size by 33.3%, and latency by 0.2ms. This is a 0.6% improvement over the original algorithm in terms of accuracy and robustness.

*ICSICA-2025-112*

## CLIMATE PREDICTION IN DATA SCIENCE USING DEEP LEARNING

**M.Abzana Begum**

Assistant Professor, Master of Computer Application  
Dhanalakshmi Srinivasan Engineering College (A), Perambalur  
abzanabegum@gmail.com

**P.Varshini**

Assistant Professor, Master of Computer Application  
Dhanalakshmi Srinivasan Engineering College (A), Perambalur  
Email id: pvarshinibca@gmail.com

### ABSTRACT

Up until early 2000's climate predictions were made mainly using statistical methods. This prediction wasn't always entirely accurate. With the introduction of machine learning and deep learning in climate prediction, the prediction accuracy has improved dramatically. The sensors in the weather stations give massive amount of unstructured data. Due to the humungous amounts of sensors and data from it, it's almost impossible to compute all the necessary weather information in time. AI and deep learning help to overcome this problem using different models which can swiftly and accurately make this job simple. Accurate climate prediction is very important to predict is very important to predict any natural calamities or unexpected change in weather. This report highlights few of the deep learning models which can be used for climate prediction by scientists. This paper only takes scratches the surface of the capabilities of AI in climate change. More advancements in this field would lead to better simulations of the weather conditions which can then be useful to predict the extreme weather conditions accurately. Few of the authors have used unique models in their prediction of various temperature, rainfall, pollution levels etc. which have helped them to find the discrepancies in the climate if any.

**Keywords:** Deep learning, climate, prediction.

*ICSICA-2025-113*

**HYBRID MACHINE LEARNING MODELS FOR FAKE NEWS ANALYSIS**

**Mrs. Archana**

Assistant Professor, Department of CSE

Dhanalakshmi Srinivasan Engineering College, Perambalur

**ABSTRACT**

Fake News generates incorrect suspense information that can be discovered. This conveys false information about a country's status or exaggerates the cost of certain government activities, eroding democracy in some countries, such as the Arab Spring. Associations such as the "House of Commons and the Crosscheck project" address issues like publisher responsibility. However, because they rely solely on manual detection by people, their coverage is limited. This is not sustainable nor feasible in a world where billions of items are withdrawn or uploaded each second. The paper conducts a thorough analysis of previous research on false news detection on the given datasets and offer algorithm utilizing Multi-layered Principal Component Analysis for feature selection, followed by a firefly-optimized algorithm. Multiple Support Vector Machines (MSVM) are eventually utilized to categorize the news. We tested the suggested technique on ten different datasets. As the number of features in data-sets increases, feature extraction and selection approaches aid in improving the accuracy of the corresponding data-sets. Only datasets with a smaller number of features performed poorly on our feature extraction algorithms.

*ICSICA-2025-114*

## **A SECURE AND PRIVATE VOTING SCHEME USING BLOCKCHAIN TECHNOLOGY**

**S. Francis Shamili**

Assistant Professor, Department of CSE

Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur

francis.sham1995@gmail.com

### **ABSTRACT**

Democracy and Voting are the pillars of a Nation. A mistrust towards the Electronic Voting Machine has made democratic voting in a country very critical. Security such as hacking, technical issues such as malfunction in the software and authenticity such as duplicate votes are the major problems of Electronic Voting Machine. Declining trends of participant rate in an election have also increased in recent years. One of the reasons seems to be that youths find going to voting centers to vote impractical. To address all these problems the need for a more practical and modern voting system is increasing. The primary objective is to resolve problems of the traditional and digital voting system in India with the help of Electronic - Voting using Blockchain technology (E-V-BCT). The proposed method can be used in the voting system to have a fair election and reduce injustice. It offers new opportunities to deploy a secure voting system in a country. It can reduce a lot of efforts and resources invested in polling stations, specifying the areas, appointing staff, and preventing security risks at polling stations with the help of encryption and hashing techniques. This research is going to propose a platform based on modern Blockchain technology that provides maximum transparency and reliability of the system to build a trustful relationship between voters and election authorities. The proposed platform provides a framework that can be implemented to conduct voting activity digitally through blockchain without involving any physical polling stations. Since voting is made online, it is expected that this will increase the voter turnouts.

**Keywords:** E-Voting, Blockchain technology, Democracy, polling, hashing techniques

*ICSICA-2025-115*

## AI –DRIVEN PREDICTIVE ANALYTICS IN HEALTHCARE IMPROVING PATIENT OUTCOMES

**V. Elavenil**

Assistant Professor, Department of CSE  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur

### **ABSTRACT**

Artificial intelligence (AI)-driven predictive analytics is transforming healthcare by facilitating early disease detection, streamlining treatment regimens, and enhancing patient outcomes. This study examines predictive analytics' effects on the healthcare industry, emphasizing its uses, advantages, and approaches. We illustrate how predictive analytics can result in improved health outcomes, more effective healthcare delivery, and cost savings through a review of recent research and case studies. We also go over the difficulties and potential paths ahead for utilizing predictive analytics in clinical practice.

**Keywords:** Artificial Intelligence, Healthcare, Predictive Analytics.

*ICSICA-2025-116*

## SMART MONITORING OF RAILWAY TRACKS USING AI-BASED OBJECT DETECTION

**K. Ramya**

Assistant Professor, Department of CSE

Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur

gramya.vmk@gmail.com

### ABSTRACT

In order to improve safety, operational effectiveness, and the general dependability of rail transit, object detection in railway lines is a crucial area of study for the railway sector. For object identification in railroad lines, a variety of technologies and techniques can be used, such as computer vision, LiDAR, radar, thermal imaging, and sensor networks, among others. Trains, maintenance equipment, trespassers, and impediments may all be tracked and classified using machine learning and deep learning algorithms for picture and data analysis. Furthermore, railway tracks can include sensors and detectors positioned strategically to capture This research explores the developments and difficulties related to railway line object detecting systems. and seeks to offer a comprehensive perspective on object detection in a railroad setting. It addresses many different subjects, such as the kinds of things found, the techniques and tools used, practical uses, and the field's prospects for the future. The gathering of data, mostly from high-resolution photos and videos, is essential to this system. These data sources come from a number of places, such as stationary cameras placed alongside railroad tracks and cameras installed on locomotives. This multi-source data gathering serves as an essential basis for real-time monitoring and analysis, allowing the system to react quickly to objects or possible obstacles that are detected.

**Keywords:** YOLO, COCO, CNN, Building the API/GUI, Machine Learning

*ICSICA-2025-117*

## **AUTHENTICATION SYSTEM FOR PRIVACY PRESERVATION REAL TIME MACHINE LEARNING BASED MEDICAL MONITORING SYSTEM**

**Ramya Priyatharsini.T.G, Saravana Kumar.S, Lalithavani.K, Preethi.S**

Assistant Professor, Department of Information Technology

Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur

ramyasigamani77@gmail.com

**S.R.Saranya**

Assistant Professor, Department of Artificial Intelligence and Data Science

Muthayammal College of Engineering Rasipuram

sr.saranya88@gmail.com

### **ABSTRACT**

In recent years, the integration of real-time machine learning in medical monitoring systems has gained significant traction due to its potential to revolutionize healthcare delivery. However, ensuring robust privacy and data security remains a critical challenge. This work presents an advanced authentication system designed to safeguard patient information and maintain data integrity within real-time machine learning-based medical monitoring platforms. By implementing a multi-factor authentication framework that leverages biometric verification and encrypted communication protocols, the system ensures that only authorized personnel can access sensitive medical data. This approach effectively addresses privacy concerns and minimizes the risk of data breaches, enabling a secure environment for medical diagnostics and decision-making. The proposed system employs advanced machine learning models to analyze real-time physiological data, offering accurate and timely predictions for patient health. To enhance privacy preservation, the system integrates federated learning, allowing distributed training on edge devices without transmitting raw data to central servers. This decentralized approach not only protects patient confidentiality but also reduces latency, ensuring seamless real-time operation. Extensive simulations and real-world evaluations demonstrate the effectiveness of the authentication system and its compatibility with various medical monitoring applications. This work sets a foundation for the development of secure, intelligent, and patient-centric healthcare technologies.

*ICSICA-2025-118*

## **A CERTIFICATELESS PUBLIC CLOUD DATA INTEGRITY AUDITING SCHEME ENHANCED WITH BLOCKCHAIN TECHNOLOGY**

**Saravana Kumar.S, Ramya Priyatharsini.T.G, , Lalithavani.K**

Assistant Professor, Department of Information Technology  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur  
saravana.coolya@gmail.com

### **ABSTRACT**

Cloud storage has become increasingly prevalent with the growth of cloud computing. To ensure the availability and integrity of data stored in the cloud, numerous cloud data auditing techniques have been proposed in academic research. However, many of these solutions rely on public key infrastructure and identity-based encryption, leading to challenges in certificate management and key escrow. To address these issues, we propose a public cloud data integrity auditing system that leverages certificateless encryption and blockchain technology. Our approach incorporates blockchain technology to track the activities of semi-trusted third-party auditors and resolve associated concerns. To enhance the efficiency of dynamic data updates while preserving data privacy, we introduce a novel data structure that integrates a unique counting bloom filter with a Multi-Merkel hash tree technique. The system's security is based on the assumption of the discrete logarithm problem, and its security model is rigorously defined. In the performance analysis section, we compare the scheme's functionality and computational costs with existing approaches in the literature. The testing results demonstrate the scheme's effectiveness and overall performance.

**Keywords:** Cloud storage, certificateless encryption, dynamic updating, integrity auditing, privacy protection.

*ICSICA-2025-119*

## **BLOCKCHAIN ENABLED COLLABORATIVE MULTI-CLOUD DATA STORAGE WITH INTEGRITY VERIFICATION**

**S. Abirami**

Assistant Professor, Department of Information Technology  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur  
aameera211296@gmail.com

### **ABSTRACT**

Single points of failure, data breaches, and unauthorized access are some of the common problems that traditional centralized cloud storage systems face. This paper suggests a blockchain-based method for safe cloud data storage with regulated data access to solve these issues. The proposed approach makes use of blockchain's decentralized and immutable features to assure the security and integrity of data that is stored. Because blockchain technology is decentralized and unchangeable, it can improve data storage security and transparency. By dispersing data over several internet servers and protecting it, the proposed approach removes the possibility of one point of failure. To guarantee data integrity and stop unauthorized alterations, the data is then stored on a blockchain as a sequence of tamper-proof blocks. The blockchain is a chain of blocks made up of each block that has a hash reference connecting it to the one before it. These impartial organizations conduct routine audits of the data that is stored and confirm its accuracy by comparing it to the blockchain's hashes. By removing single points of failure, prohibiting unauthorized modifications, and utilizing AES based encrypted data storage, the suggested solution improves data storage security. This method overcomes the drawbacks of conventional cloud storage systems via the centralized and transparent features provided by blockchain technology, offering greater safety, data integrity, and restricted data access.

**Keywords:** Access control, chain nodes, data auditing, blockchain verification, including tamper-proofing

*ICSICA-2025-120*

## **CLOUD SECURITY USING LEAST SIGNIFICANT BIT STEGNOGRAPHY**

**A. Siva Sankari, S. Preethi**

Assistant Professor, Department of Information Technology  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur  
sankarisiva001@gmail.com

### **ABSTRACT**

The Cloud Computing is a dynamic term, which gives question free information rethinking office which keeps the client from weights of nearby stockpiling issues. Presently a-days, distributed computing demonstrated its significance where it is being utilized by little and large associations. The significance of distributed computing is because of the different administrations given by the cloud. One of these administrations is capacity as an administration (SaaS) which permits clients to store their information in the cloud information bases. The disadvantage of this administration is the security challenge since an outsider deals with the information. The clients need to have a sense of security to store their information in the cloud. Thus, we need for models that will upgrade the information security. The picture steganography is an approach to shield information from unapproved access. Picture steganography permits clients to hide mystery information in a cover picture.

**Keywords:** Cloud Computing, Data Storage Security, LSB, Data hiding, Steganography, PSNR, MSE.

*ICSICA-2025-121*

## **INTERNET OF THINGS (IOT) IN AGRICULTURE: AN OVERVIEW**

**Kalpana. A, Gayathri. R**

Assistant Professor, Department of Master of Computer Application  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur  
kalpanaanbarasan23@gmail.com

### **ABSTRACT**

Climate change, land degradation, and limited land and water resources have challenged our ability to meet the food demand of a rapidly growing population. To tackle this challenge, modern agricultural systems are relying on new technologies like the Internet of Things (IoT) to improve agricultural productivity and resource use efficiency. Although IoT has gained considerable attention in the last few years, the key concepts of IoT and their applicability across different domains of agriculture are still new to many researchers, practitioners, managers, and policymakers. In this paper, we provide a comprehensive review of the use of different IoT platforms, wireless sensor networks, and other associated technologies like remote sensing, cloud computing, and big data analytics in digital agriculture. The review also explores the use of communication technologies, microcontrollers, and machine learning in smart irrigation and decision support systems. The necessity of interoperability (data transfer and communication without human interference) among devices is discussed in detail with regard to facilitating and exchanging agricultural data more effectively. The discussion also includes opportunities and challenges in standardizing.

*ICSICA-2025-122*

## **MACHINE LEARNING FOR DDOS ATTACK DETECTION AND MITIGATION IN VEHICULAR AD HOC NETWORKS**

**Preethi.S, Siva Sankari.S, Ramya Priyatharsini.T.G**

Assistant Professor, Department of Information Technology  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur  
sprieethi@gmail.com

### **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.

*ICSICA-2025-123*

## **GREENBOT: AI-DRIVEN SMART ROBOTIC SYSTEM FOR SUSTAINABLE GREENHOUSE MANAGEMENT**

**Nivetha. S, Dhivya. A, Kiruthiga. P**

Assistant Professor, Department of Information Technology  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur  
niviiit.it@gmail.com

### **ABSTRACT**

The Automation of agriculture plays a vital role in improving efficiency, reducing crop loss, and yielding better quality harvests. In this Paper, an AI-driven autonomous rover is proposed that is particularly developed for real-time detection and removal of rotten tomatoes to enhance crop management. The system utilizes YOLOv8, a cutting-edge deep learning algorithm, for precise image classification, thus ensuring efficient detection of rotten tomatoes with high accuracy. Upon detection, a robotic arm is triggered to remove the infected tomatoes, thus preventing contamination and maintaining healthy crops. For enhancing autonomous mobility and optimizing the effectiveness of operations, the robot is equipped with ultrasonic sensors for smart object detection and avoidance of obstacles. Additionally, the sensors continuously monitor temperature and humidity levels, thus ensuring optimal environmental conditions for field operations. Manual crop inspection and removal of damaged crops through traditional means is time-consuming, labor-intensive, and prone to variability. Conversely, the proposed system employs AI-based automation, thus enhancing detection accuracy by 40%, labour dependency by 35%, and overall harvesting efficiency by 25%. By leveraging cutting-edge computer vision, robotics, and precision agriculture, this research proposes a scalable and smart solution for modern farming practices. The use of real-time sensing and autonomous decision-making not only increases productivity but also improves sustainable agricultural practices. The results of this research illustrate the revolutionary potential of AI-based robotic systems in transforming traditional agricultural practices, making them more efficient, reliable, and economically viable.

**Keywords:** YOLOv8, Robotic Arm, Object Detection, Autonomous.

*ICSICA-2025-124*

## OUT-OF-DISTRIBUTION (OOD) DETECTION BASED ON AI WITH MACHINE LEARNING TECHNIQUES

**Gayathri. R, Kalpana. A**

Assistant Professor, Department of Master of Computer Application  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur  
gaukrishna15@gmail.com

### ABSTRACT

Out-of-Distribution (OOD) detection uses a model to separate input data into ID (In-Distribution) and OOD data. In the field of machine learning, this issue is receiving more and more attention. Good intrusion detection, fraud detection, system health monitoring, sensor network event detection, and ecosystem interference detection have all been attained by OOD detection. The deep learning-based approach to OOD detection is the most researched. This article describes the fundamentals of deep learning-based OOD detection and classifies techniques based on training data. There are three categories for OOD detection: supervised, semi supervised, and unsupervised. When using supervised data, the techniques are divided into three technical categories: density-based, distance-based, and model-based. Background information, examples, and applications are provided for each classification. We also discuss the challenges and expectations in this field, as well as the most recent deep learning-based OOD detection applications. Both the accuracy of detection and the devaluation of training operation conditions proximity are supported by validation over complex scenarios (predictive maintenance, vehicle platooning, and covert channels in cyber security).

**Keywords:** Anomaly detection; Machine learning; Neural networks (NN); Distribution detection; Out-of-Distribution detection (OOD); outlier detection.

*ICSICA-2025-125*

## ACCIDENT NOTIFICATION AND DEATH PREVENTION

**V. Gokulakrishnan**

Assistant Professor, Department of CSE  
Dhanalakshmi Srinivasan Engineering College, Perambalur

**Sidhiqul Aflah, Tibin Roby, Thufail N, Siva Sakth**

Department of CSE  
Dhanalakshmi Srinivasan Engineering College, Perambalur

### ABSTRACT

Road traffic accidents remain a leading cause of death worldwide, underscoring the urgent need for innovative safety solutions. This project presents an Accident Death Prevention System (ADPS) that utilizes an Arduino Uno board integrated with a Global Positioning System (GPS) module and crash detection sensors. The proposed system aims to enhance emergency response times and improve the chances of survival following vehicular accidents. The ADPS is designed to continuously monitor the vehicle's status using an accelerometer-based crash sensor. Upon detecting a significant impact, the system activates a series of processes. It automatically retrieves the vehicle's geographic coordinates through the GPS module and sends an immediate alert to predefined emergency contacts via SMS. This alert includes critical information such as the exact location of the accident, enabling swift assistance from emergency services. The hardware setup comprises an Arduino Uno, an accelerometer sensor for crash detection, a GPS module for location tracking. The software is programmed to process sensor data, validate crash incidents, and initiate the communication protocol seamlessly. The integration of these components not only ensures accurate detection of vehicular impacts but also enhances the reliability of emergency notifications.

**Keywords:** accident notification, death prevention, GPS, location notification.

*ICSICA-2025-126*

## **AI-POWERED SMART ATTENDANCE MANAGEMENT SYSTEM USING FACIAL RECOGNIZATION**

**S. R. Sowmiya**

Assistant Professor, Department of CSE,  
Dhanalakshmi Srinivasan Engineering College, Perambalur.

**Mugunthan P, Muthazhagan R, Oppilamani L, Radhakrishnan R**

Department of CSE,  
Dhanalakshmi Srinivasan Engineering College, Perambalur.

### **ABSTRACT**

This face recognition-based attendance tracking system utilizes computer vision and deep learning techniques to automate attendance marking in educational and organizational settings. The system is developed using Python libraries, including OpenCV for image processing, face recognition for facial detection and encoding, Firebase for cloud-based data storage and notifications, and Twilio for automated SMS alerts. The system operates by capturing real-time video frames from a webcam and detecting faces using the Histogram of Oriented Gradients (HOG) as provided by the face recognition library. Once detected, the system encodes faces using deep metric learning (dlib's face encodings based on ResNet-34) and compares them with stored encodings of registered students. If a match is found and attendance conditions are met, the student's attendance is recorded in Firebase. If an unknown face is detected, the system captures and logs the image while notifying the staff. To ensure accuracy and efficiency, the system incorporates Euclidean distance-based matching for face recognition. It also enforces time-based restrictions to prevent multiple attendance markings, integrates error handling mechanisms, and provides a real-time user interface for monitoring recognition results with robust automation, enhanced security, and efficient attendance tracking, this system significantly reduces manual effort while ensuring a seamless and contactless attendance management solution suitable for educational institutions and corporate environments.

*ICSICA-2025-127*

## **BRAIN STROKE DETECTION WITH DEEP LEARNING**

**B. Deepika**

Assistant Professor, Department of CSE  
Dhanalakshmi Srinivasan Engineering College, Perambalur

**Visva A, Santhosh B, Raja R, Raghuraman R**

Department of CSE  
Dhanalakshmi Srinivasan Engineering College, Perambalur

### **ABSTRACT**

A brain stroke occurs when blood flow to the brain is interrupted leading to potential brain damage and loss of functions controlled by the affected area. Timely diagnosis and intervention are critical for minimizing long-term disabilities and improving recovery outcomes. This study addresses the critical challenge of brain stroke detection by utilizing a combination of deep learning and machine learning techniques. We first extracted features from the VGG16 model, a well-established convolutional neural network known for its efficacy in image classification tasks. These extracted features were then enhanced and transferred using the Gaussian Naive Bayes (GNB) model, integrated with non-negative matrix factorization to optimize feature representation. Our innovative approach, termed Neuro-VGNB, aims to leverage these advanced methodologies to improve classification accuracy significantly. To evaluate the effectiveness of our Neuro-VGNB model, we conducted comprehensive comparisons between traditional spatial features and the newly proposed transfer features. Remarkably, the Logistic Regression (LR) model yielded a high accuracy score of 99.96% indicating the robustness of our method. Furthermore, we employed k fold cross-validation to ensure reliable performance assessment and to facilitate state-of-the-art comparisons with existing methods in the literature. The findings of this study not only highlight the potential of our Neuro-VGNB approach in enhancing the detection of brain strokes but also demonstrate its applicability in clinical settings.

*ICSICA-2025-128*

**SECURE AUTHENTICATION FRAME WORK WITH EDGE COMPUTING  
FOR REAL TIME PATIENT HEALTH MONITORING IN IOMT**

**K. Ramya**

Assistant Professor, Department of CSE,  
Dhanalakshmi Srinivasan Engineering College, Perambalur.

**Manoj Alex. G Mohamed Irfan. J Prabu. A Kathirvalavan. G**

Department of CSE,  
Dhanalakshmi Srinivasan Engineering College, Perambalur.

**ABSTRACT**

Traditional cloud-based healthcare systems face latency and security challenges in real-time patient data transmission. This project proposes a Secure Authentication-Based Patient Healthcare Report Transmission System using Edge Computing to enable faster and more secure data sharing. By processing and authenticating patient reports at edge nodes, the system minimizes reliance on centralized cloud storage, reducing transmission delays. Secure authentication mechanisms, including multi-factor authentication and role-based access control, ensure authorized access while maintaining data integrity.

*ICSICA-2025-129*

## **YOLOV3 BASED BLIND ASSISTANT SYSTEM FOR REAL TIME OBJECT DETECTION**

**S. Francis Shamili**

Assistant Professor, Department of CSE,  
Dhanalakshmi Srinivasan Engineering College, Perambalur.

**Pradeep S, Prathyush N P, Kenes K Roby**

Department of CSE,  
Dhanalakshmi Srinivasan Engineering College, Perambalur.

### **ABSTRACT**

Real-time object detection plays a critical role in automation, smart systems, and assistive technologies. This project presents an ESP32-based object detection system that integrates an ultrasonic sensor, an LCD display, a speaker for voice alerts, and IoT connectivity. The system accurately detects objects in its vicinity, providing real-time feedback via an LCD screen and auditory cues. The integration of IoT technology enables remote monitoring and control through a mobile application, enhancing accessibility and user interaction. The ESP32 microcontroller processes sensor data and facilitates wireless communication, making the system cost-effective and energy-efficient. Python programming ensures flexibility and ease of customization. Compared to traditional object detection systems, which primarily rely on proximity sensors without real-time feedback or IoT capabilities, this system introduces enhanced interactivity through voice playback and cloud-based monitoring. Existing systems often require complex setups and lack remote accessibility, limiting their usability. A literature review highlights the increasing adoption of IoT-based detection systems, especially leveraging ESP32 for low-cost and efficient Wi-Fi communication. Voice-based feedback has been explored in automation applications, but its integration with real-time object detection in low-power systems remains underutilized. This project provides a comprehensive and scalable solution for applications in home automation, security, and assistive technologies. Future enhancements could incorporate machine learning for advanced object recognition and the integration of additional sensors for improved detection accuracy.

*ICSICA-2025-130*

## **AUTOMATED MEDICINAL PLANT IDENTIFICATION USING DEEP LEARNING FOR IMPROVED HEALTHCARE**

**Tamilanbu B, Suriyaprakash S, Santhosh Kumar M, Salman khan N**

Department of CSE,

Dhanalakshmi Srinivasan Engineering College, Perambalur.

### **ABSTRACT**

With thousands of plant species present in the world, many of them possessing medicinal properties, the identification of these plants plays a crucial role in healthcare, drug manufacturing, and environmental management. Proper identification benefits various sectors, including the forest department, life scientists, physicians, medication laboratories, and the public. While manual identification by skilled practitioners has been the traditional method, it is often time-consuming and prone to misidentification, which could lead to side effects or serious health risks. To address these challenges, this project proposes an automated system for medicinal plant classification using deep learning algorithms. In recent years, the use of deep learning techniques, particularly in computer vision, has gained traction for solving complex identification problems. The proposed system employs convolutional neural networks (CNNs), which are highly effective in feature extraction and classification tasks. The model utilizes Xception-based feature extraction, followed by classification with a CNN classifier, demonstrating high accuracy and faster prediction times with real-time images. By automating the identification process, the system aims to enable faster and more reliable recognition of medicinal plant species. This advancement could significantly reduce errors, increase efficiency, and provide immediate access to valuable plant-based medicinal data for various stakeholders, ensuring safer and more effective use of medicinal plants in healthcare.

*ICSICA-2025-131*

## **AUTOMATED HYBRID MODEL-BASED LUNG CANCER PREDICTION USING HISTOPATHOLOGY IMAGES WITH DEEP LEARNING**

**T. Geetha**

Assistant Professor, Department of CSE,  
Dhanalakshmi Srinivasan Engineering College, Perambalur.

**Kabilan .D Karthikraj .S Nikil .S Vikram M**

Department of CSE,  
Dhanalakshmi Srinivasan Engineering College, Perambalur.

### **ABSTRACT**

Lung cancer is one of the leading causes of cancer-related deaths worldwide. Early and accurate diagnosis is important to improve survival rates. Histopathology image analysis is the standard method for diagnosing lung cancer, but manual examination is slow, depends on individual expertise, and can lead to inconsistencies. To solve these issues, we propose a deep learning-based approach for automated lung cancer detection using histopathology images. Our method uses Generative Adversarial Networks (GANs) to improve image quality and increase dataset diversity. This helps the model learn better and reduces bias in classification. We work with three lung tissue types: Normal lung tissue (lung\_n), Lung adenocarcinoma (lung\_aca), Lung squamous cell carcinoma (lung\_scc). For classification, we use an ensemble learning model that combines EfficientNet, ResNet, and DenseNet. These models work together in a voting system to improve accuracy. The model is trained on both real and GAN-enhanced images, helping it recognize lung cancer subtypes more effectively. We evaluate our approach using accuracy, precision, recall, and F1-score. Our results show that combining GAN-based image enhancement with ensemble learning improves classification performance compared to using individual deep learning models. To further support medical professionals, we integrate a Large Language Model (LLM) for decision support. We also use Prometheus and Grafana to monitor model performance in real time.

*ICSICA-2025-132*

**AN EFFICIENT BLOCKCHAIN ENABLE SCORE  
VOTING WITH RECOGNITION AND AUTHENTICATION**

**S. Chinnadurai**

Assistant Professor, Department of CSE,

Dhanalakshmi Srinivasan Engineering College, Perambalur.

**Saran N, Vigneshwaran M, Daniel Ashik Raj, Shafiq Deen S**

Department of CSE,

Dhanalakshmi Srinivasan Engineering College, Perambalur.

**ABSTRACT**

Electronic voting systems must ensure security, transparency, and voter authentication to maintain electoral integrity. This paper proposes a blockchain based online voting system that integrates cryptographic hashing, multibiometric authentication, and location verification to enhance security and prevent fraudulent voting. Each vote is recorded as a transaction in the blockchain, ensuring immutability, transparency, and verifiability. The system employs a multibiometric authentication mechanism, incorporating face, and fingerprint recognition using the Grassmann algorithm to enhance accuracy and prevent identity fraud, while enforcing the one-person, one-vote principle. Fingerprint recognition adds another reliable layer of user authentication, improving system robustness against spoofing or impersonation. Additionally, a location-based validation system ensures that voters can only cast their votes from authorized booth, preventing remote or proxy voting. To preserve voter anonymity, cryptographic hashing and Zero-Knowledge Proofs (ZKPs) are utilized, allowing for verifiable elections without compromising privacy. The proposed system addresses major challenges in online voting, such as vote manipulation, double.

*ICSICA-2025-133*

## **AI : THE FUTURE**

**Hari Narayan S, Gokul M, Faizal Basha S, Aarthi P**

Department of CSE,  
Dhanalakshmi Srinivasan Engineering College, Perambalur.

### **ABSTRACT**

Artificial Intelligence (AI) stands at the forefront of technological evolution, redefining the boundaries of human capability and innovation. As we move deeper into the 21st century, AI is no longer a concept of the future—it is an integral part of our present, influencing industries such as healthcare, education, transportation, finance, and entertainment. The future of AI promises even more transformative changes, with intelligent systems poised to perform complex tasks, make decisions, and interact with humans in increasingly natural and meaningful ways. At its core, AI aims to simulate human intelligence through machines capable of learning, reasoning, problem-solving, and adapting to new information. With advancements in machine learning, deep learning, natural language processing, and robotics, AI systems are becoming more autonomous, efficient, and capable of self-improvement. These technologies are driving innovations such as self-driving cars, personalized medicine, intelligent virtual assistants, smart cities, and predictive analytics. However, the future of AI also raises critical questions around ethics, privacy, job displacement, and the need for transparent and responsible AI governance. As we embrace the benefits of AI, it is crucial to ensure its development aligns with human values and societal needs. The journey ahead lies in balancing rapid technological growth with thoughtful regulation and ethical frameworks. Ultimately, AI holds immense potential to augment human life, solve complex global challenges, and shape a future that is smarter, safer, and more connected.

*ICSICA-2025-134*

**STOCK MARKET PREDICTION USING LONG SHORT-TERM MEMORY  
(LSTM)**

**B. Deepika**

Assistant Professor, Department of CSE,  
Dhanalakshmi Srinivasan Engineering College, Perambalur.

**Karikalan, Nandhakumaran, Nikilan M, Prasanth D**

Department of CSE,  
Dhanalakshmi Srinivasan Engineering College, Perambalur.

**ABSTRACT**

This project aims to develop a predictive model for stock market prices using Long Short-Term Memory (LSTM) networks, a type of Recurrent Neural Network (RNN) suitable for time series forecasting. The model is trained on historical stock data and uses technical indicators as input features to predict future stock prices. The LSTM network is designed to capture long-term dependencies and patterns in the data, allowing for accurate predictions of stock price movements. The project evaluates the performance of the model using metrics such as mean absolute error and mean squared error, and compares it to traditional machine learning models. The results show that the LSTM model outperforms traditional models in predicting stock prices, demonstrating the potential of deep learning techniques in stock market prediction. This project contributes to the development of more accurate and reliable stock market prediction models, which can be used by investors and financial analysts to make informed decisions.

*ICSICA-2025-135*

## **IOT – ENABLED DIGITAL TWIN FRAMEWORK FOR SECURE MONITORING IN THE DEFENSE INDUSTRY**

**S. Francis Shamili**

Assistant Professor, Department of CSE,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur.  
francis.sham1995@gmail.com

**Akshaya M, Anusha R, Anusha R,**

Department of CSE,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur.

### **ABSTRACT**

Authentication plays a critical role in safeguarding the defense industry's sensitive information, personnel, and assets from unauthorized access and security breaches. As defense operations become increasingly digitized, robust authentication mechanisms are essential to ensure the integrity and security of military systems, networks, and facilities. The rapid advancements in technology and the increasing complexity of defence operations necessitate the development of secure and efficient monitoring systems. This project presents a Internet of things based digital twin technology integrated with AI-powered facial recognition technology with block chain technology to address the unique security challenges faced by the defence industry. The proposed system leverages blockchain's inherent advantages, such as decentralization, immutability, and enhanced security, to create a robust platform for monitoring personnel, assets, and critical infrastructure. By utilizing facial recognition for real-time identification and verification of personnel, the system automates access control, allowing only authorized individuals into restricted areas or to sensitive resources. The biometric data of authorized personnel is securely stored on the blockchain, preventing tampering and ensuring data privacy. Every access attempt whether successful or unauthorized is recorded in the decentralized ledger, providing an immutable audit trail for accountability and compliance.

*ICSICA-2025-136*

## **AI-DRIVEN SKINCARE ADVISOR: YOLO-POWERED SKIN ANALYSIS AND COSMETIC SUGGESTIONS**

**T. Sarathi,**

Department of CSE,

Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur.

### **ABSTRACT**

The integration of artificial intelligence (AI) into skincare and cosmetics has opened new opportunities for personalized beauty solutions. Introduces a chatbot system that provides tailored cosmetic recommendations based on individual skin types and conditions. Utilizing the YOLO (You Only Look Once) algorithm, the system performs real-time skin analysis by detecting skin types such as acne-prone-skin, burned-skin, dry-skin and oily-skin from user-provided images. The chatbot combines these insights with user input on preferences and concerns to deliver customized product suggestions and skincare routines. The YOLO algorithm's efficiency in object detection ensures rapid and accurate analysis, while the chatbot interface enhances user accessibility and interaction.

*ICSICA-2025-137*

**BLIND ASSISTANT SYSTEM - OBJECT DETECTION FOR VISUALLY  
IMPAIRED PEOPLE USING DEEP LEARNING**

**T.G.Ramya Priyatharsini**

Assistant Professor, Department of Information Technology,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur.

**Kaviyadharshini. M, Umavathi. U, Vadhanika. B, Yujin. S**

Department of Information Technology,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur.

**ABSTRACT**

Visually impaired individuals face significant challenges in navigating their surroundings safely and independently. This paper presents a Blind Assistant System that leverages deep learning-based object detection to assist visually impaired people in recognizing and identifying objects in real time. The system utilizes advanced convolutional neural networks (CNNs) and pre-trained models such as YOLO (You Only Look Once) or Faster R CNN to detect and classify objects efficiently. A camera captures the surrounding environment, and the processed information is conveyed to the user through audio feedback. The system is designed to operate on embedded hardware like Raspberry Pi or mobile devices, ensuring portability and ease of use. By integrating deep learning, computer vision, and speech synthesis, this system enhances the mobility and independence of visually impaired individuals, providing them with a reliable and intelligent navigation aid. Navigating the environment safely is a major challenge for visually impaired individuals. This software project introduces a Blind Assistant System, an AI-powered solution that leverages deep learning for real-time object detection and audio feedback. The detected objects are then converted into speech output using text-to-speech (TTS) technology, allowing users to perceive their surroundings through auditory cues.

**Keywords:** Object Detection, Deep Learning, Blind Assistant, YOLO, Computer Vision, Speech Feedback

*ICSICA-2025-138*

**DEEP LEARNING-BASED SKIN CANCER IDENTIFICATION WITH CNN  
FOR ACCURATE SKIN CLASSIFICATION**

**S. Chinnadurai**

Assistant Professor, Department of CSE,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur.

**Harish P, Keerthi V, Krishnaraj K, Kamal Raj B**

Department of CSE,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur.

**ABSTRACT**

Skin cancer is one of the most common and rapidly increasing forms of cancer worldwide, necessitating early and accurate detection for effective treatment. Traditional diagnostic methods rely heavily on visual examination and biopsy, which can be time-consuming, subjective, and costly. Recent advancements in deep learning have shown promising results in automating skin cancer classification, improving diagnostic accuracy, and reducing dependency on clinical expertise. This study proposes a Convolutional Neural Network (CNN)-based skin classification model for skin cancer identification. The proposed model is trained on a large dataset of dermoscopic images, enabling it to automatically extract relevant features and differentiate between malignant and benign skin lesions. The CNN architecture enhances feature learning through multiple convolutional layers, improving classification accuracy compared to conventional machine learning techniques. Experimental evaluations demonstrate that the proposed model achieves high accuracy, sensitivity, and specificity, making it a reliable tool for assisting dermatologists in early skin cancer detection.

*ICSICA-2025-139*

## **COGNITIVE AGRO-METABOLISM: ASCENDANT VERTICAL ECO- OPTIMIZATION MATRIX**

**B. Maha Lakshmi**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**M. Abzana Begum**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

This project is dedicated to transforming traditional agricultural practices through the implementation of vertical farming, a cutting-edge approach that allows for the efficient planting and cultivation of a diverse range of fruits and vegetables. Utilizing three innovative methods hydroponics, aeroponics, and aquaponics this initiative aims to maximize yield while significantly reducing resource consumption in terms of time and space. The result is a higher output of nutrient-rich produce, essential for meeting the growing demand for healthy food options in urban environments. The process begins by capturing client requests and conducting a thorough assessment of product availability. This step ensures that the cultivation strategies align with market demand, allowing for a more responsive and efficient production cycle. Once requests are registered, the project implements advanced cultivation techniques to optimize growth conditions, such as tailored nutrient solutions, climate control systems, and automated monitoring. This level of precision in the cultivation phase is critical for ensuring that the plants thrive in a controlled environment, leading to increased productivity. In the harvesting module, efficiency and timing are paramount. Careful planning allows for the collection of produce at its peak quality, enhancing both flavor and nutritional value. Rigorous testing protocols are then conducted to analyze the nutrient content and safety of the harvested fruits and vegetables.

*ICSICA-2025-140*

## **AMELIORATION OF ECO SHIELD INSULATION WITH EXHAUSTIVE PARADIGM**

**R. Vennila**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

Building materials got from horticultural and modern waste are getting some decent forward movement in structural designing and engineering because of their manageability and lower natural effect. This study investigates the utilization of rice husk, wheat husk, wood filaments, and material waste strands in making biodegradable composites with a poly (butylene adipate-co-terephthalate)/poly (lactic corrosive) (PBAT/PLA) mix fastener, handled through hot squeezing. Morphological examination shows that the PBAT/PLA folio has a higher proclivity for wood and material filaments contrasted with wheat and rice husks. The composites display warm steadiness up to 250°C and exhibit compressive qualities between 11-40 MPa and flexural qualities between 0.80-2.25 MPa, appropriate for building applications. Particularly, the rice husk composite has a density of 378 kg/m<sup>3</sup> and a thermal conductivity of 0.08 W/mK, making it an excellent insulation material. Due to the binder's resistance to water, it also shows only 42% water absorption and remains cohesive even after 24 hours in water. Its potential to replace conventional building materials is highlighted by these properties. Eco Shield Rice Husk Insulation extends this strategy by producing a high-performance insulation material from rice husks, a renewable by product of rice production. This imaginative protection arrangement decreases squander and gives a practical option in contrast to energy-concentrated materials like fiberglass and polystyrene. The assembling system of rice husk protection has a lower natural effect, utilizing less energy and delivering less ozone harming substance emanations.

*ICSICA-2025-141*

## **TRAFIFIC SIGN DETECTION USING DEEP LEARNING**

**G. Pavithra**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

### **ABSTRACT**

Traffic Sign Detection revolutionizes traffic management through its cutting-edge application of deep learning techniques. Utilizing convolutional neural networks (CNNs), the system offers unparalleled accuracy in real-time identification of diverse traffic signs. Its training on a comprehensive dataset of annotated images ensures robust performance across varied environments and lighting conditions. The system's integration of real-time speech synthesis technology further enhances its functionality. Upon detecting a traffic sign, the system provides audible alerts to the driver, bolstering situational awareness without diverting visual attention. This auditory feedback proves crucial, especially in complex driving situations, facilitating swift and informed decision-making. By synergizing advanced deep learning algorithms with speech synthesis, Traffic Sign Detection delivers a holistic solution to traffic sign recognition challenges. It not only elevates accuracy but also enriches the user experience by offering intuitive and timely auditory feedback. This integrated approach sets a new benchmark for intelligent transportation systems.

*ICSICA-2025-142*

## **MACHINE LEARNING IN MONEY LAUNDERING DETECTION OVER BLOCKCHAIN TECHNOLOGY**

**R. Thayalammal**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**P. Varshini**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

Money laundering, a complex process used to conceal illicit financial activities, continues to pose significant challenges to financial institutions and regulatory bodies globally. The rise of blockchain technology, with its decentralized, transparent, and immutable nature, offers both opportunities and challenges for detecting such activities. While blockchain provides the ability to track all transactions, its pseudonymous features, where users are represented by cryptographic addresses rather than identities, make it difficult to identify suspicious activities using traditional methods. However, blockchain's inherent transparency allows for the application of machine learning (ML) techniques to enhance anti-money laundering (AML) efforts. This paper explores the role of ML in detecting money laundering over blockchain platforms. It examines several ML methods, including anomaly detection, predictive modeling, network analysis, and behavioral profiling, to identify potential money laundering activities. Anomaly detection models can flag transactions that deviate from normal patterns, allowing for the early identification of suspicious behavior. Network analysis, utilizing graph-based models such as graph neural networks (GNNs), helps trace the flow of funds between addresses, uncovering potential money laundering networks. Predictive models, developed through supervised learning, can predict the likelihood of a transaction being linked to illicit activity, providing real-time risk assessment.

*ICSICA-2025-143*

## **SMART HOME FOR ELDERS IOT BASED ALERT SYSTEM FOR ELDER PEOPLE**

**T. Vaishnavi**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**P. Varshini**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

Home fires have been taking place frequently and the threat to human lives and properties is growing in recent years. Liquid petroleum gas (LPG) is highly inflammable and can burn even at some distance from the source of leakage. Most fire accidents are caused because of a poor-quality rubber tube or the regulator is not turned off when not in use. Therefore, developing the gas leakage alert system is very essential. Hence, this paper presents a gas leakage alert system to detect the gas leakage and to alarm the people onboard. Addition to that we also monitor the water leakage, By through water sensor.

*ICSICA-2025-144*

**SMART ASSISTANCE ON BLIND PEOPLE SHOPPING ASSISTANCE ON  
TRAINED VOICE FEATURES**

**J. Gopinath**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**R. Gayathri**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**ABSTRACT**

Blind people shopping in offline are the tedious process where they need assistance wherever they go. Thus, an efficient shopping generation with virtual reality needs to be generated for the blind people in supermarkets for grocery shopping. Thus, the generated system initially provides Artificial Intelligence and Machine learning based supervised shopping for blind people. The implementation works using Hidden Markov Model (HMM) algorithm where it converts the voice data into text and text data into voice. This helps to work out to make a voice search and voice product description with navigation assistant for the product. The product search matched using Natural Language Processing (NLP) technique into the pre-trained database system. The voice navigation and product details will be pre-trained with supervised learning system. On using these two algorithms makes a good shopping generation system. Thus, the proposed system efficiently proves out to be a best solution for the blind people shopping.

*ICSICA-2025-145*

## **EMPOWERING THE DEAF COMMUNITY: GESTURE LANGUAGE RECOGNITION THROUGH COMPUTER VISION MECHANISMS**

**R. Naveen**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**M. Abzana Begum**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

Sign language is used by those who have speech and hearing impairments to communicate. Disabled People employ non-verbal communication techniques like these sign language movements to convey their feelings and ideas to other regular people. Speaking with those who have hearing loss is really difficult. Since Deaf and Mute persons utilize hand gestures to communicate, normal people have difficulty understanding their language from the signals they make. Systems that can identify various indications and provide information to common people are thus necessary. However, these regular people find it difficult to interpret their expression, thus during medical and legal appointments, educational and training sessions, skilled sign language skills are needed. The demand for these services has grown during the previous several years. Other types of services have been established, such as video remote human interpretation utilizing a high-speed Internet connection. These services offer a simple sign language interpretation service that may be utilized and is beneficial, but has significant drawbacks. Use artificial intelligence technologies to assess the user's hand using finger detection in order to solve this issue. Design the vision-based system for this suggested system in real-world settings. Convolutional Neural Network algorithm (CNN), a deep learning technique, is then used to categories the sign and offer a label regarding the recognized sign. The project's design was carried out utilizing a Python framework.

*ICSICA-2025-146*

## **ADVANCED ROAD SURFACE POTHOLE DETECTION VIA DEEP LEARNING-DRIVEN IMAGE ANALYSIS**

**M. Sharmila**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

**A. Kalpana**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

The research presents a novel application of image processing techniques for pothole detection, leveraging the YOLOV8 algorithm. The system's primary goal is to achieve efficient and accurate detection of potholes in real-time by acquiring high-resolution images or video frames of road surfaces. By focusing on adaptability to diverse road images and conditions, the system aims to enhance its robustness, ensuring reliable performance regardless of environmental variables. This adaptability is crucial for addressing the variability in road surfaces and lighting conditions encountered in real world scenarios. Moreover, the development of a user-friendly interface is emphasized to facilitate seamless system integration and intuitive data visualization. Such an interface will enable users to interact with the system effectively, allowing for easy monitoring of pothole detection results and providing valuable insights for road maintenance efforts. By promptly identifying and addressing potholes, this approach holds the potential to significantly improve road safety and maintenance. The ability to detect potholes in real-time allows for quicker response times in repairing road infrastructure, reducing the risk of accidents and damage to vehicles. This research contributes to advancing the field of road maintenance by introducing a robust and efficient system for pothole detection, with potential implications for enhancing transportation infrastructure worldwide.

*ICSICA-2025-147*

## **SECURE BACKUP AND RECOVERY VIA QUANTUM CRYPTOGRAPHY IN CLOUDS**

**P. Vaishali**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous)Perambalur-621212.

**P. Varshini**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous)Perambalur-621212.

### **ABSTRACT**

The rapid adoption of cloud computing has revolutionized data storage, backup, and recovery processes, offering enhanced flexibility, scalability, and accessibility. However, these advantages come with significant security concerns, particularly related to data privacy, integrity, and unauthorized access. Traditional cryptographic methods, while effective, face vulnerabilities to advanced threats such as quantum computing, which can potentially break current encryption schemes. To address these emerging threats and provide a robust solution for secure data backup and recovery, this study proposes the use of quantum cryptography for safeguarding cloud-based backup systems. Quantum cryptography, which relies on the principles of quantum mechanics, offers unprecedented security guarantees that are not achievable with classical cryptographic techniques in this approach, Quantum Key Distribution (QKD) is employed to establish secure communication channels between the user and the cloud service provider. QKD enables the exchange of encryption keys in a way that is immune to eavesdropping and interception, leveraging the fundamental principles of quantum mechanics, such as the no-cloning theorem and the uncertainty principle. These properties ensure that any attempt to intercept the key during transmission will be immediately detectable, allowing for secure key establishment without the risk of compromise.

*ICSICA-2025-148*

## **DETECTING PARKINSON'S DISEASE USING AI**

**E. Vallarasan**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**P. Varshini**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

Parkinson's Disease (PD) is a progressive neurodegenerative disorder that affects motor and non-motor functions, significantly impacting the quality of life. Early and accurate diagnosis is crucial for effective treatment and management. Traditional diagnostic methods rely on clinical assessments and neurological examinations, which may lead to delayed detection. Recent advancements in Artificial Intelligence (AI), including machine learning (ML) and deep learning (DL) techniques, have demonstrated promising potential in improving the accuracy and efficiency of PD detection. AI models analyze various data modalities, including speech patterns, gait dynamics, handwriting analysis, and neuroimaging data, to identify PD-related abnormalities.

*ICSICA-2025-149*

## INTELLIGENT VEHICLE BREAKDOWN RESPONSE SYSTEM

**V. Gurumoorthi**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**R. Gayathri**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### ABSTRACT

“Vehicle Breakdown Assistance Management System” is a web-based application which provide roadside assistance to those vehicles which fails on you and you have no clue what to do. In this project we tried to develop a computerized and web based “Vehicle Breakdown Assistance Management System. Our main intention is to allow this application to be used in most retailing roadside assistance Provider Company, where a small point of customization will be required to each company in the implementation period. This system is designed to overcome all challenges related to the management of that were used to be handled locally and manually. The system is an online application that brings up various roadside assistance working online. This application can be incredibly handy when your vehicle breaks down and it’s not possible to repair it on the spot. The service provider will usually assist you to tow it to your preferred location. Although towing location can be entirely your choice.

*ICSICA-2025-150*

## **OPEN CV- BASED FACE DETECTION SECURITY SYSTEM**

**C. Gokul**

Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

**R Govindasamy**

Assistant Professor, Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

### **ABSTRACT**

In the era of advanced security systems, facial recognition has become a key tool for ensuring automated, contactless, and reliable surveillance. This project, Multi-CNN-Based Face Detection Security System, leverages Convolutional Neural Networks (CNNs) for real-time face detection and recognition, offering a robust security mechanism. The system is designed with HTML and CSS for the frontend, while the backend utilizes Python (Flask), OpenCV, and Multi-CNN architectures to enhance accuracy and efficiency. Unlike traditional face detection methods, this system employs multi-CNN models, combining feature extraction from different layers to improve detection precision, even under varying lighting, angles, and facial occlusions. The system continuously monitors an environment through a webcam, analyzing facial features in real-time. Detected faces are compared against a pre-trained database, and if an unauthorized individual is identified, an automated email alert (using Python's smtplib) is sent to the security personnel with a time stamped snapshot of the intruder. Additionally, all detection logs are stored for future security analysis. This intelligent security solution is applicable in corporate offices, homes, and restricted access areas, providing an AI-driven, scalable approach to facial authentication.

*ICSICA-2025-151*

## **BLOCKCHAIN ASSISTED TWO LAYER DATA STORAGE WITH ROLE BASED VERIFIABLE DATA SHARING**

**A. Arulraj**

Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

**R. Govindasamy**

HOD, Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

### **ABSTRACT**

Fog computing is an extended concept of cloud computing. Fog computing is an on-going research trend in which the possibility of efficient network services exists. Fog computing can be described as a cloud type platform having similar services of data computation, data storage and application service but it is fundamentally different as it decentralized. In the era of digital healthcare, the security and privacy of medical records are paramount. This project aims to design and implement a comprehensive system for the secure storage and controlled access of medical records. The TLS (Two Layer Security) framework makes full use of fog server's storage and data processing capability. The architecture includes three layers, the cloud server, the fog server and the local machine. Leveraging Advanced Encryption Standard (AES) encryption for data confidentiality, a fog computing layer for real-time processing, and cloud storage for scalability, the system establishes a robust framework to safeguard sensitive healthcare information. It also performs the data integrity protection using Blockchain Technology. A trusted authority system is introduced to manage permissions for data owners and users, ensuring authorized access. Role-Based Access Control (RBAC) mechanisms are implemented to restrict data access based on user roles, adhering to the principle of least privilege. A secure file request and verification process enables users to access specific medical records, with stringent authentication protocols. The proposed system not only addresses current security challenges but also provides a foundation for ongoing adaptability to emerging threats in the dynamic landscape of healthcare information management.

*ICSICA-2025-152*

## **ELECTRIC VEHICLE BATTERY CARE AND SHOP**

**S. Selvakumar**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**A. Kalpana**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

The world's primary modes of transportation are facing two major problems: rising oil costs and increasing carbon emissions. As a result, electric vehicles (EVs) are gaining popularity as they are independent of oil and do not produce greenhouse gases. However, despite their benefits, several operational issues still need to be addressed for EV adoption to become widespread. This research delves into the evolution of EVs over time and highlights their benefits, including reducing carbon emissions and air pollution. It also explores the challenges and difficulties faced in their adoption, such as the high cost of infrastructure, scarcity of charging stations, limited range or range anxiety, and the performance of batteries. To overcome these challenges, potential solutions include enhancing the charging infrastructure, increasing the number of charging stations, using battery swapping techniques, and improving battery technology to address range anxiety and reduce charging times. Governments can incentivize consumers to purchase EVs through tax credits or subsidies and invest in building a robust charging infrastructure. Industry stakeholders can collaborate with governments to address these challenges and promote the adoption of EVs, which can contribute to reducing carbon emissions and air pollution.

**Keywords:** electric vehicles; smart cities; challenges; charging infrastructure

*ICSICA-2025-153*

## **PREDICTIVE MODEL FOR REQUEST THE ELECTRIC POWER USING MACHINE LEARNING METHODOLOGY**

**A. Fazlullah**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**R.Govindasamy**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

The main challenge in achieving each nation's long-term objectives has been forecasting the demand for power. Inadequately measuring the amount of power required leads to under- or over-generating electricity and may also lead to significant expenditures in energy resources. To get around these issues, forecasting techniques based on time series data and predictive analysis is applied. The conventional time-series forecasting techniques cannot be utilized when working with seasonal data and outside influences. Accurate power forecasting for electrical consumption prediction is a crucial tool in energy planning for producing companies since it helps analysts comprehend and forecast market electricity demand. In a competitive market, their power output can be modified accordingly. This project's goal is to estimate the short-term power demand using a machine learning algorithm. We create and assess electricity demand prediction models utilizing data that is readily available to the public. This model was created using the Support Vector Machine method, a machine learning technique. A globally optimum solution may be obtained because of the specific structure of SVM, which makes training SVM analogous to resolving a linearly restricted quadratic programming problem. High-dimensional data handling is strength of SVM. SVM uses a hyper-plane to divide the data into two distinct classes while maximizing the margin between the classes. Different assessment criteria that are often employed in time series analysis are utilized to assess the produced models.

*ICSICA-2025-154*

## **DEEP FAKE DETECTION APPLICATION**

**S. Gomathi**

Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur,621212

**R.Gayathri**

Assistant Professor, Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur,621212

### **ABSTRACT**

Deepfake detection, a critical area in AI and cybersecurity, aims to identify AI-generated manipulations in images and videos, which can lead to misinformation, identity fraud, and digital deception. Detection techniques focus on inconsistencies in facial features, lighting, textures, and unnatural expressions, while in videos, they also examine lip-sync issues and motion anomalies. Advanced AI models like CNNs, RNNs, and Transformers improve detection accuracy, and methods like frequency analysis and biological cue detection strengthen the process. Datasets such as Face Forensics++ and DFDC are used for training detection models, with tools like Microsoft Video Authenticator and Deep ware Scanner aiding in real-time detection. On the software side, the front end is built with HTML and CSS, the back end uses Python, and the framework used is Flask. As deepfake technology evolves, robust detection frameworks are essential for maintaining digital authenticity and security.

*ICSICA-2025-155*

## **CROWD DETECTION AND ALLOTMENT IN TOURIST PLACE**

**K. Dharani**

Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur,621212  
dharani290801@gmail.com

**R. Govindasamy**

HOD, Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur,621212

### **ABSTRACT**

Crowd detection in tourist places is a critical application of artificial intelligence and computer vision that ensures effective crowd management, safety, and enhanced visitor experiences. This project leverages Python programming, integrated with machine learning and image processing libraries such as OpenCV, TensorFlow, and Scikit-learn, to monitor and analyze crowd density in real-time. The system utilizes camera feeds or drone footage to process video frames, applying techniques like object detection (using models such as YOLO or SSD) and crowd density estimation through convolutional neural networks (CNNs). These algorithms identify individuals, calculate crowd sizes, and generate actionable insights, such as heat maps and congestion alerts. The solution aims to mitigate risks associated with overcrowding, such as stampedes, while improving operational efficiency by guiding visitors to less crowded areas. Python's flexibility, combined with its extensive libraries, makes it an ideal choice for implementing such systems. This framework can be integrated with IoT devices and cloud platforms for enhanced scalability and real-time analytics, providing a robust tool for modern tourist destination management.

*ICSICA-2025-156*

## **AN EFFICIENT AUTOMATED WATER QUALITY ASSESSMENT SYSTEM UTILISING MACHINE LEARNING AND IOT**

**M. Mathesh Pandiyan**

Department of Master of Computer Applications

Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

**M.Abzana Begum**

Assistant Professor, Department of Master of Computer Applications

Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

### **ABSTRACT**

Water quality is a fundamental determinant of environmental health, public safety, and sustainable development. Conventional methods for assessing water quality are predominantly manual, time-consuming, and often fail to deliver timely data for effective decision-making. This paper presents the design and implementation of an efficient, automated water quality assessment system that integrates Internet of Things (IoT) technology with machine learning techniques. The proposed system utilizes a network of low-cost, real-time sensors to continuously monitor essential water parameters such as pH, turbidity, temperature, dissolved oxygen, and electrical conductivity. These sensor nodes communicate wirelessly with a central processing unit where collected data is aggregated and analyzed. Supervised machine learning models, including Random Forest and Support Vector Machine (SVM), are trained on historical and real-time sensor data to classify water quality and detect potential anomalies. The system also incorporates predictive analytics to forecast contamination risks, enabling timely intervention and resource management. The prototype demonstrates a high level of accuracy in water quality classification and significantly reduces the dependency on manual testing methods. This framework provides a scalable and cost-effective solution for continuous water monitoring in diverse environments such as rivers, lakes, and industrial discharge zones.

*ICSICA-2025-157*

## **CUSTOMER CHURN PREDICTION USING MACHINE LEARNING**

**K. Suriya**

Assistant Professor, Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

**P. Varshini**

Assistant Professor, Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

### **ABSTRACT**

Customer churn is a critical issue for businesses, as retaining existing customers is often more cost-effective than acquiring new ones. Predicting customer churn enables organizations to proactively identify at-risk customers and take strategic actions to retain them. This study focuses on leveraging machine learning techniques to predict customer churn based on historical customer behavior and transaction data. Various algorithms such as Logistic Regression, Decision Trees, Random Forest, and Support Vector Machines were employed and evaluated for their predictive performance. Data preprocessing techniques like handling missing values, feature selection, and normalization were applied to enhance model accuracy. The results demonstrate that machine learning models can effectively identify potential churners, with Random Forest providing the highest accuracy and robustness in prediction. This approach can help businesses improve customer retention strategies, reduce churn rates, and ultimately increase profitability.

*ICSICA-2025-158*

## **GAMERS COMMUNITY WITH SUGGESTIONS**

**S. Sakthivel**

Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

**A. Kalpana**

Assistant Professor, Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

### **ABSTRACT**

The gaming industry has experienced rapid growth, leading to an overwhelming number of games being released every year. With countless options available, players face the challenge of discovering games that match their individual preferences. Traditional game discovery methods, such as browsing game stores or relying on manual recommendations, can be inefficient and time consuming. To address this issue, the "Game Suggestions" system presents an innovative, intelligent approach to game recommendation, leveraging the power of machine learning to offer personalized suggestions tailored to individual user preferences. This system is built using the Django web framework, which serves as the backbone for a dynamic and scalable web platform. It integrates machine learning techniques, such as collaborative filtering and content-based filtering, to provide accurate and relevant game suggestions. By analyzing user behavior, preferences, and historical data, the system generates recommendations that are finely tuned to the user's unique tastes. The core of the system lies in its structured dataset, which is based on a comprehensive collection of game-related information, including attributes like genre, ratings, user reviews, and platform compatibility. Through the preprocessing of this data and the application of advanced filtering algorithms, the system efficiently narrows down game suggestions that align with the user's interest.

**Keywords:** Game Recommendation, Machine Learning, Django, Personalized Suggestions, Collaborative Filtering, Content-Based Filtering, User Preferences, Gaming Platform.

*ICSICA-2025-159*

## **GRAPHICAL PASSWORD BY IMAGE SEGMENTATION**

**J. Kamlesh**

Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

**R. Gayathri**

Assistant Professor, Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

### **ABSTRACT**

The number of data-leakages has been grown up rapidly in recent years these are found by using the statistic firms, research institution and government organizations. The careless activities of human are one of the important causes of the data loss. The solutions for detecting sensitive data leaks caused by human mistakes. With the help of using pseudorandom key generator algorithm the sensitive data is protected. An approach is used to screen the content in storage and transmission for exposing sensitive data information. This approach needs the detection operation that has been conducted in secrecy. The detection servers may be satisfied in the secrecy requirements. By using pseudorandom key generator algorithm, we have provided the solution for privacy preserving data leakage detection. The main advantage in this method is that it enables the data owner to safely delegate the detection operation to a semi honest provider without revealing the sensitive data to the provider and it also reduces the false alarms.

*ICSICA-2025-160*

**SOPHISTICATED HYDROCHEMICAL REMEDIATION PROTOCOLS FOR  
AQUEOUS PHASE POLYMER SEQUESTRATION AND PARTICLE  
AGGREGATION DYNAMIC**

**S. Pappi Sri**

Department of Master of Computer Applications

Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

**M. Abzana Begum**

Assistant Professor, Department of Master of Computer Applications

Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

**ABSTRACT**

This project focuses on the efficient removal of micro plastics from various water resources through a comprehensive five-module system: Micro plastic Detection, Filtration, Organic Substance Enrichment, Decontamination, and Testing. The CTF (Capture, Treat, Filter) method is applied to effectively capture and remove micro plastic waste, ensuring cleaner water for environmental and human use. The process begins with Micro plastic Detection, where the concentration of micro plastics is identified. This data is then passed to the Filtration module, which focuses on filtering the micro plastics from water sources, followed by the Decontamination module that deals with further cleansing of the water by removing harmful contaminants. The Organic Enrichment module evaluates and balances organic substances in the water to optimize filtration, ensuring that organic material does not affect the final purity of the water. Each module is governed by an admin who manages employee registration, status verification, and credentials distribution. The employees within each module are responsible for fetching data from the previous stages, uploading necessary water quality information such as sample volumes, chemical compositions, pH levels, and micro plastic concentrations, and performing critical calculations to generate accurate results.

*ICSICA-2025-161*

## **PERSONAL ASSISTANCE FOR SENIORS WHO ARE SELF-RELIANT**

**N. Darwingsingh**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur, 621212

**R. Govindasamy**

HOD, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur, 621212

### **ABSTRACT**

This is an Web based application in which an automatic alert ringing system is implemented. It focuses on doctor and patient interaction. Patients need not remember their medicine dosage timings as they can set an alert on their dosage timings. The alert can be set for multiple medicines and timings including date, time and medicine description. A voice commands notification will be sent to them through email or message inside the system preferably chosen by the patients. The system focuses on easy navigation and good user interface. Many such Medicine Reminder Systems have been developed where a new hardware is required but, in our work, we have made an attempt to develop a system which is economical, time-saving and supports medicine adherence.

*ICSICA-2025-162*

## **A COMPARATIVE ANALYSIS OF MEDICAL FRAUD DETECTION IN HEALTHCARE USING DATA BALANCING & MACHINE LEARNING TECHNIQUES**

**S. Selvakumar**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur, 621212

**P. Varshini**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur, 621212

### **ABSTRACT**

Medical fraud in healthcare systems is a significant issue that not only leads to substantial financial losses but also compromises patient safety and the integrity of healthcare services. As fraudulent claims continue to rise, the application of machine learning (ML) techniques has become crucial in automating fraud detection. However, the effectiveness of ML models often suffers due to data imbalance, where fraudulent claims represent a small fraction of the total dataset. This paper presents a comparative analysis of several machine learning algorithms combined with data balancing methods such as SMOTE, ADASYN, and Random Under sampling to enhance fraud detection accuracy. We examine performance metrics including precision, recall, F1-score, and ROC-AUC to evaluate the robustness of these techniques. Our findings suggest that balanced data significantly improves the detection capability of ML models, with ensemble methods like Random Forest and XGBoost yielding the best performance in fraud classification tasks.

*ICSICA-2025-163*

## SMART AND SECURE WAREHOUSE MANAGEMENT SYSTEM USING IOT

**G. Umamaheswari**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur,621212

**P. Varshini**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur,621212  
pvarshinibca@gmil.com

### ABSTRACT

The present work aims to contribute to the development of a platform for IOT based integrated model for warehouse inventory management and environment monitoring. The technique presents the idea of sensor hubs, low-control systems, and IOT Gateways utilized as a part of warehouse scenarios. The sensor node monitors the quantity of inventories and environmental parameters. IOT gateway transfers and standardize the information and can remotely control the operations of sensor node. The major thought of suggested technique is to accelerating information aggregation and stock administration, enhances remote monitoring, effectiveness, and control of physical resources, and efficiency. This paper presents a remote monitor and control alarm system based on internet of things. All the sensors level monitored in the remote location using IOT module. Once the abnormal occurs, the IOT gets the alarm signal immediately to cloud, and the system controls the fire Extinguishers automatically. To reduce fire accident level in warehouse, we are using fire sensor, we fix them on the door. Once the fire is detected using flame sensor then the water pump will turn on automatically to extinguish the fire.

*ICSICA-2025-164*

## **A SUPPORT VECTOR MACHINE LEARNING TECHNIQUE FOR DETECTION OF PHISHING WEBSITE**

**E. Vignesh**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous)perambalur,621212

**P. Varshini**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous)perambalur,621212

### **ABSTRACT**

Phishing websites pose a significant threat to online security by deceiving users into revealing sensitive information. This study explores the application of Support Vector Machines (SVMs), a robust machine learning technique, for detecting phishing websites. The proposed approach involves extracting key features from website URLs, domain information, and content, such as URL length, HTTPS usage, and domain age. These features are used to train an SVM model, leveraging its ability to handle high-dimensional data and nonlinear decision boundaries through kernel functions like RBF. The model is evaluated using metrics such as accuracy, precision, recall, and F1-score, demonstrating its effectiveness in distinguishing phishing websites from legitimate ones. Challenges such as imbalanced datasets and computational costs are addressed through techniques like feature scaling and hyper parameter tuning. The results highlight SVM's potential as a reliable tool for real-time phishing detection, offering a proactive defense against cyber threats. This work contributes to advancing cybersecurity measures by leveraging machine learning for enhanced phishing website identification.

*ICSICA-2025-165*

**PERSONALIZED BLOOD PRESSURE CONTROL BY MACHINE  
LEARNING FOR REMOTE PATIENT MONITORING**

**Mohamed Ibrahim**

Department of Master of Computer Applications

Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

**P. Varshini**

Assistant Professor, Department of Master of Computer Applications

Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

**ABSTRACT**

This paper presents a novel approach to personalized blood pressure control using Machine Learning (ML) for remote patient monitoring. The system leverages wearable IoT to continuously capture real-time physiological data such as blood pressure, heart rate, physical activity, and sleep patterns. These data are transmitted securely to a cloud-based platform for analysis. Advanced ML algorithms are employed to analyze patient-specific trends, predict blood pressure fluctuations, and recommend personalized interventions. The system dynamically adapts to individual health profiles, considering factors such as age, lifestyle, and medication history. Real-time alerts and actionable recommendations are sent to both patients and healthcare providers through a user-friendly dashboard and mobile applications. This data-driven solution enables proactive management of hypertension, improves medication adherence, and empowers patients to take control of their cardiovascular health. By integrating remote monitoring, predictive analytics, and personalized recommendations, the system reduces the need for frequent hospital visits and enhances healthcare outcomes. The proposed approach has the potential to revolutionize blood pressure management and contribute to a more efficient and patient-centered healthcare's

*ICSICA-2025-166*

## **ANALYSIS AND PREDICTION OF CAR PRICES USING A PRICING DATASET**

**N. Sri Balaji**

Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

**A. Kalpana**

Assistant Professor, Department of Master of Computer Applications  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

### **ABSTRACT**

The automobile industry is highly dynamic, with car prices influenced by various factors such as brand, model, manufacturing year, engine specifications, mileage, and market trends. This project focuses on the Analysis and Prediction of Car Prices using Machine Learning techniques applied to a pricing dataset. The objective is to uncover patterns in car pricing data and build predictive models that accurately estimate the price of a car based on its features. The study begins with data pre-processing, including handling missing values, encoding categorical data, and scaling numerical features. Exploratory Data Analysis (EDA) is performed to identify key pricing trends and correlations between features. Multiple machine learning models, such as Linear Regression, Random Forest, Gradient Boosting, and Support Vector Regression (SVR), are trained and evaluated using metrics like Mean Absolute Error (MAE), Root Mean Squared Error (RMSE), and  $R^2$  score. The results demonstrate that advanced machine learning algorithms, particularly ensemble methods, provide high accuracy in predicting car prices. The insights from this study can be valuable for car dealerships, online marketplaces, and consumers seeking fair price assessments.

*ICSICA-2025-167*

## **NOVEL POLYMER INTEGRATION IN ELEVATING STANDARDS FOR PROTECTIVE COATINGS**

**M. Suruthi**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous)perambalur,621212

**P. Varshini**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous)perambalur,621212

### **ABSTRACT**

Bisphenol A (BPA) is a manufactured compound found in various plastics and tars. Due to the fact that BPA can enter food and beverages from holders made with it, concerns have been raised about its potential effects on health. The potential of bio-based lacquers derived from tomato processing waste, specifically tomato pomace, as long-term alternatives to metal food packaging coatings containing bisphenol A (BPA). Products containing bisphenol A that are frequently used may lead to a variety of health issues, including cardiovascular disease, diabetes, difficulties in child development, metabolic issues, and other conditions. The facade was conveyed through a few stages, transforming the side effects into significant materials that aid the human in maintaining a solid presence. There are a couple of stages drew in with making the, including drying tomato waste like seeds, slup, and skins in the sun and changing them into a powder in the microwave. From that point onward, the pomace's cell walls are separated by a compound like sodium hydroxide (NAOH) in the powder, permitting the lipid to be delivered. This provoked the polymerization of the lipid segment, which was solidly checked with specular infrared spectroscopy to choose the degree of esterification. The substance is then made waxy by mixing it with ethanol alcohol. The findings demonstrated that, in comparison to TFS and ETP substrate finishes, aluminum substrate finishes had superior mechanical properties and higher basic burdens. The hydrophobicity of the coatings was also most significant on aluminum, as shown by the water contact point evaluations.

*ICSICA-2025-168*

## **ONLINE NETWORK DOS/DDOS DETECTION: SAMPLING, CHANGE POINT DETECTION, AND MACHINE LEARNING METHODS**

**B. Mohanapriya**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**M. Abzana Begum**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

Denial-of-Service (DoS) and Distributed Denial-of-Service (DDoS) attacks continue to be major threats to the security and availability of online networks. The increasing scale and sophistication of these attacks necessitate the development of effective real-time detection techniques. This paper explores the integration of sampling methods, change point detection, and machine learning techniques for the detection of DoS/DDoS attacks in online networks. Sampling methods are utilized to reduce the computational load by analyzing a representative subset of network traffic, while change point detection identifies abrupt shifts in traffic patterns that could indicate the onset of an attack. Machine learning models, both supervised and unsupervised, are employed to classify traffic as either normal or indicative of an attack based on historical data. Supervised approaches like decision trees, random forests, and support vector machines are discussed, alongside unsupervised methods such as clustering and anomaly detection algorithms. Furthermore, real-time detection is addressed by leveraging streaming algorithms and hybrid systems that combine multiple detection techniques for enhanced accuracy and efficiency. The challenges of scalability, evasion techniques, and minimizing false positives are also examined. The proposed methods demonstrate the potential for adaptive, scalable, and efficient DoS/DDoS attack detection in dynamic and large-scale network environments.

*ICSICA-2025-169*

## **ELECTRICITY BILL MANAGEMENT SYSTEM**

**S. Srirammelesh**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**A. Kalpana**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

This mini project focuses on creating a basic Electricity Bill Management System that automates the calculation and management of electricity bills without the use of a database. The system is designed to provide users with an easy-to-use interface for inputting customer details, recording usage, and generating bills based on predefined rates. The project uses a simple file-based system for data storage, eliminating the need for complex database setups. The system allows users to input the customer's name, address, unit consumption, and category (e.g., residential, commercial). Based on the input, the system calculates the total bill by applying the appropriate tariff and including additional charges such as taxes or surcharges.

*ICSICA-2025-170*

## **MACHINE LEARNING BASED IRIS RECOGNITION MODERN VOTING SYSTEM**

**S. Kishore**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**M. Abzana Begum**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

The Machine Learning-based Iris Recognition Modern Voting System enhances election security by utilizing biometric authentication. This system captures and processes iris images, extracting unique features through advanced image processing techniques. Deep learning models such as Convolutional Neural Networks (CNN) are employed for feature extraction, while Recurrent Neural Networks (RNN) and Long Short-Term Memory (LSTM) networks analyze sequential patterns. Dimensionality reduction and anomaly detection are achieved using Deep Belief Networks (DBN) and Autoencoders. Additionally, transfer learning techniques involving that ensure accurate classification, while Support Vector Machines (SVM) and K-Nearest Neighbors (KNN) further assist in voter classification. By leveraging these technologies, the system effectively prevents fraudulent activities such as impersonation and multiple voting, ensuring a secure and transparent electoral process.

**Keywords:** Iris Recognition, Machine Learning, Biometric Authentication, Election Security,, Image Processing, Deep Learning, Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), Long Short-Term Memory (LSTM)

*ICSICA-2025-171*

## **SECURE REAL-TIME DOCUMENT SHARING USING BLOCK CHAIN**

**G. Snekha**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**A. Kalpana**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

In today's digital environment, document forgery, unauthorized access, and manipulation pose significant threats to personal and institutional data. This project presents a block chain-based application that offers tamper-proof, decentralized, and transparent storage and sharing of real-world documents. Using Ethereum smart contracts for access control and IPFS for distributed file storage, the system ensures document integrity, secure verification, and traceable access. The application is developed as a mobile-friendly solution providing secure, real-time document sharing among users without centralized intermediaries.

**Keywords:** Block chain, Smart Contract, Document Security, Real time Collaboration, IPFS.

*ICSICA-2025-172*

## **AUTOMATED SKIN CANCER DETECTION USING MACHINE LEARNING AND DEEP LEARNING TECHNIQUES**

**V. Gunasekaran**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**R. Gayathri**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

Skin conditions like acne, eczema, psoriasis, and melanoma affect millions globally, but access to dermatological care remains a challenge, particularly in remote areas. This project proposes an AI-powered automated system designed to diagnose and predict common dermatological conditions with high accuracy, implemented as a user friendly web-based platform. Users can capture real-time skin images using smartphone cameras or upload pre-existing photos for analysis. The system incorporates advanced image preprocessing techniques such as noise reduction, contrast enhancement, and image resizing to ensure high-quality input for diagnosis. Once the images are processed, they undergo deep learning-based classification using Convolutional Neural Networks (CNNs) and InceptionV3, two powerful architectures known for their precision in medical image analysis. CNNs automatically identify critical dermatological features like lesion borders, texture, color variations, and shape, while InceptionV3 enhances detection accuracy by analyzing images at multiple scales. The model is trained on a comprehensive dataset of labeled dermatological images, enabling precise differentiation between various skin conditions. In addition to diagnosis, the system generates a severity percentage, helping users assess the seriousness of their condition.

**Keywords:** Skin conditions, AI-powered system, image preprocessing, deep learning, Convolutional Neural Networks, InceptionV3, diagnosis, severity assessment, personalized recommendations, dermatology.

*ICSICA-2025-173*

## **DETECTING SUSPICIOUS FILE MIGRATION OR REPLICATION IN THE CLOUD**

**Shaik Parveen Banu**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**A.Kalpana**

Assistant Professor, Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

This guides in refining any association's security strategy because of identification of weaknesses, and ensures that the safety efforts taken really gives the assurance that the association expects and requires. Chairman necessities to perform weakness which assists them with uncovering deficiencies of organization security that can prompt gadget or data being compromised or obliterated by takes advantage of. These results are commonly heterogeneous which makes the further examination a difficult errand. Ordinary client organization might give the way to unapproved individuals to access as an approved specialist. Whenever, client's step into online organizations, without realizing them outsider or some other unsafe individual checking their way of behaving. Give the security from malevolent movement, administrator or approved individual likewise check the client organizations, for example, IP address and email.

*ICSICA-2025-174*

## **QHB-DA: A QUANTUM HYBRID BLOCKCHAIN-BASED DATA AUTHENTICITY FRAMEWORK FOR SUPPLY CHAIN IN INDUSTRY 4.0**

**S. Mounika**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

The rapid evolution of Industry 4.0, characterized by the integration of technologies like Internet of Things (IoT), artificial intelligence (AI), and robotics, has transformed global supply chains. However, the increasing complexity and scale of data flows within these systems have raised significant challenges in ensuring data authenticity, security, and transparency. This paper proposes a Quantum Hybrid Blockchain-based Data Authenticity framework (QHB-DA) to address these challenges, combining the advantages of quantum computing and blockchain technology. By leveraging blockchain's decentralized and immutable nature, QHB-DA ensures secure and transparent data recording across the supply chain, offering enhanced traceability, product provenance, and tamper-proof records. The incorporation of quantum encryption methods further strengthens the system's resilience against future cybersecurity threats posed by quantum computing advancements. This hybrid framework not only improves data integrity but also offers a scalable solution to maintain the authenticity and security of supply chain data in real-time, even in the face of evolving threats. The proposed approach holds significant potential for enhancing trust, reducing fraud, and optimizing decision-making within Industry 4.0 supply chains, thereby contributing to more secure and efficient global trade operations.

*ICSICA-2025-175*

## **CONFIDENTIALITY-DRIVEN PRIVACY PRESERVATION ON CLOUD THROUGH REVERSIBLE DATA HIDING AND ENCRYPTION**

**B. Parasuraman**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

In the healthcare sector, maintaining patient health data is a sensitive and crucial responsibility. The patient medical care records are a substantial data set that may be recorded, maintained, and tracked daily. The project's objective is to safely preserve reports on patient health. At the moment, cryptographic-based encryption transforms data into incomprehensible code, which is more likely to attract the attention of an attacker. The attacker will try to decipher this cipher-text once it has been intercepted in order to get some vital information and carry out some illegal behaviour. Some health care information not only has high expectations for privacy protection, but they may also desire to indicate what information is significant to them and what is not in order to voice their preferences in the privacy protection decision-making process. According to user choices, the proposed model classifies data into sensitive and non-sensitive categories using machine learning-based SVM (Support Vector Machine). Since it doesn't affect user privacy, non-sensitive data may be supplied without processing directly over common channels. Sensitive data, however, needs to be handled before it can be shared. Here is a method for processing sensitive data that combines data encryption with information masking. Sensitive information is first transformed into unreadable code using the Advanced Encryption Standard (AES) encryption technique before being sent. The Modified LSB (MLSB) information hiding method, a ground-breaking information concealing methodology, is then used to provide a second level of assurance about the confidentiality of sensitive data. In other words, the multimedia carrier contains sensitive information that is hidden from the opponent so that they are ignorant of its presence.

*ICSICA-2025-176*

## **AUDIO-ENHANCED MULTIMODAL TEXT-TO VIDEO SYNTHESIS BY USING NLP**

**P.Barath**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

The field of artificial intelligence has made significant strides in bridging the gap between human language and machine-generated visual content. This paper introduces a novel approach to text-to video synthesis that integrates Natural Language Processing (NLP) with audio-enhanced multimodal learning to produce highly realistic, context-aware videos from textual descriptions. Traditional text-to-video systems often lack emotional depth, temporal coherence, and accurate representation of complex scenes, largely due to the limited understanding of linguistic nuances and the absence of complementary audio signals. Our proposed framework addresses these limitations by combining semantic-rich textual analysis through advanced NLP models with relevant audio cues such as speech, environmental sounds, and background music to guide the video generation process more effectively. The inclusion of synchronized audio not only improves the realism and expressiveness of the generated content but also enhances the temporal alignment between text, sound, and visuals. Through deep learning techniques, including transformers and generative adversarial networks (GANs), the model learns to synthesize sequences that are both visually compelling and semantically meaningful. This research opens new possibilities for applications in entertainment, education, virtual storytelling, and assistive technologies, pushing the boundaries of how machines interpret and generate multimedia content based on natural language.

**Keywords:** Artificial Intelligence, text-to-video synthesis, Natural Language Processing (NLP), multimodal learning, audio-enhanced systems, deep learning, transformers, Generative Adversarial Networks (GANs), semantic analysis, video generation, synchronized audio, context-aware systems, temporal coherence, emotional depth, linguistic nuances, speech synthesis, environmental sounds, machine-generated visual content, virtual storytelling, and assistive technologies.

*ICSICA-2025-177*

## **PLAGIARISM DETECTOR USING PYTHON**

**M.Dhakshnamoorthy**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

Plagiarism is a growing concern in academic, professional, and creative fields due to the widespread availability of digital content and the ease of copying and distributing information. Detecting plagiarism effectively requires a sophisticated approach that goes beyond simple text matching. This project aims to develop a robust plagiarism detection system that can identify both direct copying and paraphrased content by leveraging advanced Natural Language Processing (NLP) and Machine Learning (ML) techniques. The proposed system employs a hybrid detection approach that combines fingerprint-based and content-based analysis methods. The fingerprint-based method generates unique hash values for text segments to quickly identify identical or highly similar sequences, while the content-based method uses semantic analysis to detect paraphrased content. Techniques such as tokenization, lemmatization, stop-word removal, and vector-based similarity analysis (e.g., cosine similarity) are applied to ensure accurate text comparison. The system also integrates a deep learning model trained on large text corpora to improve the detection of contextual similarities and subtle rephrasing. A user-friendly web-based interface is developed to enable users to upload documents for analysis. The system processes the input text, compares it against a large dataset of existing academic papers, online articles, and other textual sources, and generates a comprehensive report highlighting the plagiarized content with similarity scores. Additionally, the system is capable of cross-referencing multiple document formats, including PDF, DOCX, and TXT files. To enhance performance, the system employs parallel processing and caching techniques, which reduce the processing time for large documents and ensure real-time feedback. The solution is designed to be scalable and adaptable, allowing for the integration of additional data sources and improvements in detection algorithms.

*ICSICA-2025-178*

## **TRAFFIC LIGHT CONTROLLER FOR EMERGENCY VEHICLE**

**S. Sanjay Kumar**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

Emergency response times are a critical determinant of survival and safety outcomes in urban environments, particularly in situations involving medical emergencies, fires, and public safety threats. In highly populated metropolitan areas, traffic congestion is not only routine but also a significant obstacle to timely emergency response. Vehicles such as ambulances, fire engines, and police cars often encounter delays at congested intersections, where traditional traffic light systems operate on pre-set cycles or semi-adaptive logic, with little to no prioritization for emergency traffic. Such delays can be life-threatening and undermine the effectiveness of emergency services. This intelligent system is inherently scalable and designed for seamless integration with existing traffic infrastructure, making it both cost-effective and minimally disruptive to implement. Unlike manual override or centralized command systems, it operates in real time with negligible latency, reducing reliance on human intervention and enhancing operational efficiency. Additionally, the modular architecture ensures that the system can be expanded to cover multiple intersections in a coordinated fashion, addressing inter-junction synchronization a commonly overlooked problem in existing setups. Beyond immediate response optimization, the proposed system also contributes to the broader vision of smart city infrastructure, where AI-driven automation enhances public safety, optimizes traffic flow, and enables data driven decision-making. The reduction in response time not only saves lives but also improves the logistical efficiency of emergency services, potentially lowering operational costs and increasing service coverage. Future enhancements could involve GPS integration for route-aware signal preemption, IoT-based inter-node communication, and a central dashboard interface for monitoring and manual intervention in complex scenarios.

*ICSICA-2025-179*

## **DIET RECOMMENDATION SYSTEM**

**G. Harish**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

This project is an AI-powered Diet Plan Recommendation System designed to provide personalized meal plans based on users' health information, dietary preferences, and fitness goals. It features two types of logins: one for users and another for admins. Users can input details such as age, weight, height, activity level, and any existing health conditions to receive tailored diet suggestions from the AI. The AI processes this information and generates meal plans that best match the user's needs. Admins have the ability to manage user data, update existing diet plans, and enhance the AI's recommendation capabilities. This system simplifies healthy eating by offering smart, customized nutrition plans to each user.

*ICSICA-2025-180*

**AN EFFICIENT CIPHER TEXT POLICY ATTRIBUTE-BASED  
ENCRYPTION SCHEME SUPPORTING COLLABORATIVE DECRYPTION  
FOR LAND REGISTRATION**

**V. Premkumar**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**ABSTRACT**

In this project, a blockchain-based land registration system is proposed, which integrates Ciphertext-Policy Attribute-Based Encryption (CP-ABE) for secure data storage and collaborative decryption for authorized access. The system aims to provide a more efficient, transparent, and secure alternative to traditional land registration systems that often suffer from issues like data tampering, fraud, and inefficiency. The application involves four primary roles Admin, Buyer, Seller, and Registration Office interacting in a manner that mirrors the traditional land registration process. Sellers submit land details such as ownership, size, documents, and price to the sub-registrar for approval, which is then forwarded to potential buyers. All transactions, including ownership transfers and document submissions, are immutably stored on the blockchain in sequential order, ensuring full traceability and eliminating the need for a central record-keeping system. The system employs CP-ABE encryption to ensure that only users with valid attributes (e.g., roles, permissions) can access specific documents, ensuring data privacy and security. Additionally, collaborative decryption is implemented, allowing multiple stakeholders to decrypt encrypted information only when they meet certain access conditions. This approach enhances data protection and prevents unauthorized access. The proposed system effectively addresses the limitations of traditional land registration systems by providing an immutable, transparent, and secure framework. This blockchain-based solution ensures the integrity of land ownership records, reducing the risk of fraud and errors while improving the overall efficiency and security of the land registration process.

*ICSICA-2025-181*

## **PRODUCT IDENTIFICATION AND TEXT RECOGNITION FOR BLIND PEOPLES USING DEEP LEARNING ALGORITHM**

**K. Manoj**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212

### **ABSTRACT**

For blind persons it is very essential to recognize a product of their daily use so we implied a method to identify product in their everyday routine by use of camera. To separate an object from un-necessary background, movement based technique is used to spot object of concer from the camera by instructing person about recognized objects. The goal of the present project is to model an object detector to detect objects for visually impaired people and other commercial purposes by recognizing the objects at a particular distance. Available old techniques for object detection needed large training data it takes more time and it's quite complicated and it's a difficult task. Object detection is used in many scenarios. Conventional methods of these object detection depends on huge amount of datasets and it also takes large amount of time to train these data's, Training of small or unseen objects is a more challenging task, Human brains and visual systems are more accurate and faster in detecting objects in real time and has conscious thoughts in detecting obstacles. Due to the availability of large amount of data and with more advanced technologies and better working algorithms, classification and detection of multiple objects in the same frame has become easy with high accuracy. The main objective of the project is to design and implement a real time object recognition using real time camera. And also using implement text detection and recognition system to extract the text from captured image using Optical character recognition algorithm

*ICSICA-2025-182*

**MACHINE LEARNING AND DEEP LEARNING FOR LOAN PREDICTION  
IN BANKING: EXPLORING ENSEMBLE METHOD AND DATA  
BALANCING**

**R. Kalaiselvi**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

**ABSTRACT**

Loan approval is one of the most critical and sensitive processes in the banking sector, requiring a balance between risk management and customer satisfaction. This project introduces a machine learning-based loan prediction system that aims to automate and optimize this process using intelligent algorithms. At its core, the system employs the Random Forest Algorithm (RFA), known for its high accuracy, ability to handle complex data relationships, and resistance to overfitting. It evaluates loan applicants based on multiple factors, including credit score, income, employment history, and debt-to-income ratio, to predict their loan eligibility. To address the common challenge of class imbalance in real-world banking datasets, the model integrates SMOTE (Synthetic Minority Over-sampling Technique). This ensures that both approved and rejected cases are represented fairly, leading to more balanced and unbiased predictions. Feature engineering is also applied to identify the most relevant data points, enhancing both model performance and interpretability. The system is designed for scalability and real-time performance, providing instant eligibility checks through a user-friendly interface. By minimizing manual processing and reducing human bias, it significantly improves the efficiency and transparency of the loan approval workflow. Additionally, the system highlights feature importance, offering valuable insights into the decision-making process. Overall, this project demonstrates how combining machine learning with data balancing techniques can transform traditional banking operations. It not only enhances decision accuracy but also builds trust with applicants by making the process more transparent, fair, and efficient.

*ICSICA-2025-183*

## **AR/VR-BASED LEG FRACTURE REHABILITATION AND PHYSIOTHERAPY SYSTEM**

**A. Harisankar**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

Leg bone fractures are common injuries that require proper rehabilitation to restore mobility and strength. Traditional physiotherapy methods can be expensive, time-consuming, and inaccessible to many patients. This project proposes an Augmented Reality (AR) and Virtual Reality (VR)-based rehabilitation system that enhances physiotherapy sessions for leg fracture patients. The system will provide an immersive, interactive environment where patients can perform guided exercises, track their progress, and receive real-time feedback. By integrating motion tracking, AI-based analysis, and gamification elements, this system aims to make rehabilitation more engaging, effective, and accessible.

*ICSICA-2025-184*

## **RICH FARMER:A DIGITAL MARKETPLACE FOR AGRICULTURAL INPUTS, SERVICES AND DIRECT-TO-CONSUMER SALES**

**A. Suriyaprakash**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

Agriculture plays a crucial role in global food security and economic development, yet farmers face persistent challenges in accessing quality inputs, essential farming services, and profitable markets. The Rich Farmer web application is designed to address these issues by providing an integrated digital platform where farmers can purchase agricultural inputs, book essential services, and sell their produce directly to consumers. By leveraging digital technologies, this platform eliminates intermediaries, efficiency, and increases farmer profitability. This paper discusses the system architecture, features, and potential impact of The Rich Farmer, emphasizing its role in the digital transformation of agriculture. In order to use many of these services together the web application was purpose built using the well documented and flexible language Python, React js, HTML along with CSS and data base Mongo db. The way modern website are built home, about, service, products, contacts, sign up, login

**Keywords:** Agricultura e-commerce, Farm services, Direct market access

*ICSICA-2025-185*

## **BLOCKCHAIN ASSISTED TWO LAYER DATA STORAGE WITH ROLE BASED VERIFIABLE DATA SHARING**

**A. Arul Raj**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.  
arulr4130@gmail.com

### **ABSTRACT**

Fog computing is an extended concept of cloud computing. Fog computing is an ongoing research trend in which the possibility of efficient network services exist. Fog computing can be described as a cloud type platform having similar services of data computation, data storage and application service but it is fundamentally different as it decentralized. In the era of digital healthcare, the security and privacy of medical records are paramount. This project aims to design and implement a comprehensive system for the secure storage and controlled access of medical records. The TLS (Two Layer Security) framework makes full use of fog server's storage and data processing capability. The architecture includes three layers, the cloud server, the fog server and the local machine. Leveraging Advanced Encryption Standard (AES) encryption for data confidentiality, a fog computing layer for real-time processing, and cloud storage for scalability, the system establishes a robust framework to safeguard sensitive healthcare information. It also performs the data integrity protection using Blockchain Technology. A trusted authority system is introduced to manage permissions for data owners and users, ensuring authorized access. Role-Based Access Control (RBAC) mechanisms are implemented to restrict data access based on user roles, adhering to the principle of least privilege. A secure file request and verification process enables users to access specific medical records, with stringent authentication protocols. The proposed system not only addresses current security challenges but also provides a foundation for ongoing adaptability to emerging threats in the dynamic landscape of healthcare information management.

*ICSICA-2025-186*

## **FINDING MISSING PERSON BASED ON FACE RECOGNITION USING AI IN VIDEO SURVEILLANCE SYSTEM**

**R.Kaviyaran**

Department of Master of Computer Applications,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.  
kavi3092002@gmail.com

### **ABSTRACT**

Finding missing persons based on face recognition using AI is a promising approach that can significantly improve the speed and accuracy of missing person searches. The system involves using AI algorithms to match facial images of missing persons with real-time video footage from surveillance cameras. This project proposes a method for finding missing persons using face recognition technology in video surveillance systems. The system involves collecting data about the missing person, building a database of facial images, and using AI algorithms to match those images with real-time video footage. Artificial intelligence (AI) is a field of computer science that aims to develop intelligent machines that can perform tasks that typically require human intelligence. This includes tasks such as visual perception, speech recognition, decision-making, and language translation. AI systems are designed to learn from data, using machine learning algorithms that allow them to improve their performance over time. Deep learning, a subset of machine learning, has emerged as a powerful technique for training artificial neural networks with many layers, enabling AI systems to recognize complex patterns and make accurate predictions. The system can be implemented in public spaces, such as airports and train stations, to quickly identify and locate missing persons. The proposed system has the potential to significantly improve the speed and accuracy of missing person searches, thereby increasing the likelihood of successful reunions. Finding missing persons based on face recognition using Convolutional Neural Network (CNN) algorithm is a popular approach that has shown promising results. CNN is a deep learning algorithm that is widely used for image recognition and classification tasks, making it suitable for face recognition.

*ICSICA-2025-187*

## **BLOCKCHAIN BASED PRIVACY PRESERVING DEFENDING POISONING ATTACK IN FEDERATED LEARNING**

**T. Iswarya**

Dhanalakshmi Srinivasan Engineering College (Autonomous),  
Perambalur-621212.

### **ABSTRACT**

In the era of deep learning, federated learning (FL) presents a promising approach that allows multi-institutional data owners, or clients, to collaboratively train machine learning models without compromising data privacy. However, most existing FL approaches rely on a centralized server for global model aggregation, leading to a single point of failure. This makes the system vulnerable to malicious attacks when dealing with dishonest clients. In this work, we address this problem by proposing a secure and reliable FL system based on block chain and distributed ledger technology. Our system incorporates a peer-to-peer voting mechanism and a reward-and-slash mechanism, which are powered by on-chain smart contracts, to detect and deter malicious behaviors. Both theoretical and empirical analyses are presented to demonstrate the effectiveness of the proposed approach, showing that our framework is robust against malicious client-side behaviors. Impact Statement FL has been a promising solution to utilize multisite data while preserving users' privacy. Despite the success of integrating block chain with FL to decentralize global model aggregation, the protection of this integration from clients with malicious intent in federated scenarios remains unclear. This article presents the first formulation of this problem, and the proposed stake-based aggregation mechanism shows robustness in detecting malicious behaviors. The results in this work not only pose a new research direction in FL but can also benefit a wide variety of applications such as finance and healthcare.

*ICSICA-2025-188*

## SMART HEALTHCARE MONITORING AND APPOINTMENT SYSTEM USING DJANGO

**M. Dayana**

Dhanalakshmi Srinivasan Engineering College (Autonomous),  
Perambalur-621212.

### ABSTRACT

The Health Monitoring System is a web-based application developed using the Django framework, designed to streamline patient health management and doctor-patient interactions. This system enables patients to book appointments with doctors, track health metrics, and access their medical history, while providing doctors with tools to monitor patient progress and manage appointments efficiently. The core components include a patient portal for scheduling appointments, submitting symptoms, and viewing health records, and a doctor portal for viewing patient details, managing availability, and recording consultations. The system integrates real-time monitoring features where patients can input vital health data, which can be accessed by doctors to provide timely interventions. The use of Django's robust architecture allows secure handling of sensitive medical data, ensuring compliance with privacy standards such as HIPAA. This system offers scalability, enabling integration with wearable devices and other health monitoring tools, making it a flexible solution for modern healthcare needs. The integration of wearable devices and real-time data input allows seamless monitoring of critical health parameters, enhancing responsiveness to patient needs. Additionally, its scalable architecture ensures the system can adapt to evolving healthcare requirements, supporting future expansions like telemedicine and advanced analytics. This solution not only streamlines healthcare workflows but also fosters better doctor-patient collaboration, creating a more proactive and personalized approach to healthcare. By merging robust web technologies and intelligent machine learning, the Smart Healthcare Monitoring and Learning System aims to set a new standard in modern healthcare management.

**Keywords:** Health Monitoring System, web-based application, Django, real-time data input.

*ICSICA-2025-189*

## **LIGHTWEIGHT DEEP LEARNING FRAMEWORK FOR WHEAT GRAIN QUALITY INSPECTION USING YOLOV8N**

**B. Deepika**

Research Scholar,

Dhanalakshmi Srinivasan Engineering College (Autonomous),

Perambalur-621212.

### **ABSTRACT**

Wheat grains are a prevalent type of cereal, and their high volume and demand make traditional manual quality inspection labor-intensive and often unreliable. To tackle this challenge, this research examines intact, damaged, moldy, and shriveled wheat grains, developing an automatic quality detection model named YOLO-wheat. Initially, a substantial collection of wheat grain sample images was gathered, preprocessed, and annotated. Subsequently, object detection models YOLOv5n, YOLOv8n, and YOLOv10n were created, with YOLOv8n being chosen as the optimal base model for automatic detection of wheat grain quality. To enhance detection performance, the Dilation-wise Residual (DWR) module was incorporated into the YOLOv8n architecture, improving feature extraction from the expanded receptive field in the network's upper layers. Furthermore, the Triplet Attention mechanism was added, resulting in the improved model named YOLO-wheat. Experimental findings indicated that YOLO-wheat achieved a mean Average Precision (mAP) of 91.3% in detecting wheat grain quality, marking a 4.3% increase over the previous model. This research offers valuable technical support for the automation of wheat quality assessment.

*ICSICA-2025-190*

## **DETECTING FAKE NEWS WITH LSTM DEEP LEARNING NETWORKS**

**A. Dhivya**

Research Scholar,

Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur-621212.

### **ABSTRACT**

Newspapers are the primary source of news for people worldwide. However, off late, due to the significant growth and updates in technologies, there has been a stupendous rise in the popularity of social media as a result; social networks including social media, websites, and blogs have become important platforms for collecting diverse news information. Nowadays, individuals tend to trust social networks more than traditional newspapers. This survey paper discusses the different techniques and models employed in the identification of fake news. Our project focuses on utilizing Natural Language Processing to directly identify fake news based on the textual content of news articles. The model building and testing are done using Jupiter Notebook 6.4.11 and the news article is classified by using website which is done in HTML5, CSS3 and Flask 2.1.2. Our objective is to develop a dependable and precise model that can classify given news article as either fake or true. Using machine learning or deep learning techniques

**Keywords:** Fake news, social media, NLP, News Articles, Accuracy, deep learning techniques, tensor flow, python flask.

*ICSICA-2025-191*

## **CYBER SENTINEL V1.0**

**M. Mohammed Muzamil, M. Ragavan, S. Abinesh, P. Gothandapani**

Department of Artificial Intelligence and Data Science,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur.

**S. Suganya**

Assistant Professor, Department of Artificial Intelligence and Data Science  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur

### **ABSTRACT**

Cyber Sentinel represents a groundbreaking advancement in cybersecurity technology, combining artificial intelligence with comprehensive network analysis to create an automated, intelligent threat detection and response system. This innovative solution addresses the critical shortcomings of traditional security tools by leveraging cutting-edge machine learning algorithms and seamless integration with leading cybersecurity platforms. At its core, Cyber Sentinel employs a sophisticated multi-layered detection system that analyzes network traffic, system vulnerabilities, and behavioral patterns with unprecedented accuracy. The system's AI engine utilizes deep learning models trained on millions of malware signatures and attack patterns, enabling it to identify both known threats and zero-day vulnerabilities with a remarkable **95%** detection accuracy. This represents a 3x improvement over conventional signature-based detection methods while reducing false positives by 40%. What sets Cyber Sentinel apart is its adaptive learning capability. The system continuously refines its detection models based on new threat data, ensuring protection against evolving attack vectors. Its integration with the MITRE ATT&CK framework provides organizations with detailed threat categorization and actionable insights for security hardening.

**Keywords:** AI-Powered Cybersecurity, Threat Detection, Network Scanning, Machine Learning, Shodan Integration, MITRE ATT&CK, Automated Incident Response, False Positive Reduction, Real-Time Reporting, Enterprise Security.

*ICSICA-2025-192*

**AUTOMATIC NUMBER PLATE RECOGNITION(ANPR) WITH TENSORFLOW  
OBJECT DETECTION 1.X**

**Ravi Shankar Kumar, Suraj Kumar, Mahesh Kumar, Aliver**

Department of Artificial Intelligence and Data Science,  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur.

**Dr. Shree K. V. M**

Professor & Head, Department of Artificial Intelligence and Data Science  
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur

**ABSTRACT**

Automatic Number Plate Recognition (ANPR) has become an essential technology in intelligent transportation systems, offering efficient vehicle monitoring and management solutions. This project focuses on building an ANPR system using TensorFlow Object Detection 1.x, integrating computer vision techniques to detect and extract vehicle license plates from images or video streams. The system employs a pre-trained object detection model, fine-tuned on a custom dataset of vehicle images with labeled number plates. It utilizes convolutional neural networks (CNNs) to detect number plates, followed by Optical Character Recognition (OCR) for text extraction. The workflow involves image preprocessing, plate localization, character segmentation, and text recognition. TensorFlow's Object Detection API is leveraged to build a robust detection pipeline. The model processes live camera feeds or static images, identifies vehicle plates, and extracts alphanumeric content in real time. Data augmentation techniques improve model generalization, ensuring reliable performance under various lighting and environmental conditions. Key challenges addressed include handling blurred images, angled number plates, and varying plate designs. To mitigate errors, the project integrates adaptive thresholding, edge detection, and morphological operations during image preprocessing.

**Keywords:** Automatic Number Plate Recognition (ANPR), TensorFlow Object Detection, Computer Vision, Convolutional Neural Networks (CNN), Optical Character Recognition (OCR), Intelligent Transportation System, Real-Time Detection, Image Processing

*ICSICA-2025-193*

## **ARTIFICIAL INTELLIGENCE FOR PREDICTING DIABETES RISK**

**Mr. Praveen Kumar**

Associate Professor, Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

**Guru Prasath K, Kishore G, Kreeshma S K, Mathesh Kumar**

Department of Information Technology,  
Hindusthan College of Engineering and Technology, Coimbatore - 641032

### **ABSTRACT**

Diabetes is a chronic and prevalent illness, and early detection is crucial for proper management and the prevention of advanced complications. This project suggests creating a sophisticated machine learning-based system that can predict diabetes risk by considering numerous factors related to health. Critical patient information like age, body mass index (BMI), family medical history, and lifestyle factors will be used to categorize people based on their risk factors. The system will use various machine learning algorithms like Random Forest, Support Vector Machines (SVM), and deep learning models to ensure high accuracy in prediction. Feature selection methods will be used to determine the strongest predictors, thus increasing model efficiency and performance. The forecasting models will be trained from past healthcare data and tested on actual patient data to make them reliable and stable. The project will also investigate incorporating real-time data to provide regular updates and dynamic risk management as new data becomes available. This strategy is designed to facilitate proactive care intervention and individualized diabetes management.

*ICSICA-2025-194*

## COVID 19 DETECTION USING CNN

**Dr. G. Revathy**

Assistant Professor, Bachelor of Computer Science and Engineering,  
VELS Institute of Science Technology and Advance Studies- Chennai

**STV Surya Raj, T Vamsi Krishna**

Bachelor of Computer Science and Engineering,  
VELS Institute of Science Technology and Advance Studies- Chennai  
shanthalasurya077@gmail.com

### ABSTRACT

The novel Coronavirus also called COVID-19 originated in Wuhan, China in December 2019 and how spread across the world. It has so far infected around 30 million people and claimed approximately 940,651 lives overall. As the number of cases are rapidly increasing, most of the countries are facing shortage of testing kits and resources. AI is already transforming many different fields. One such field is the area of Medical Diagnosis through accurate clinical computer-aided diagnosis(CAD) systems. The limited quantity of testing kits and increasing number of daily cases encouraged us to come up with a deep learning model that can aid radiologists and clinicians in detecting COVID-19 cases using chest X-rays. Applying a CNN Model on a COVID-19 Radiography dataset containing Chest X-Rays, for detecting COVID-19 & achieved ~98% accuracy on the validation set with respective to Radiologist's clinical findings. The confusion matrix, the training & validation loss and accuracy curves obtained are as shown below.

**Keywords:** Chest X-ray, Deep Learning, Data Augmentation.

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## **GESTURE CONTROL MOUSE**

**P.V. Hemavathi**

Assistant Professor, Bachelor of Computer Science and Engineering,  
VELS Institute of Science Technology and Advance Studies- Chennai

**Vangala Sidhartha Reddy, Bhimagunta Sandeep**

Bachelor of Computer Science and Engineering,  
VELS Institute of Science Technology and Advance Studies- Chennai  
vangalasadharthareddy07@gmail.com

### **ABSTRACT**

Mortal computer commerce has a long history to come more intuitive. For mortal being, gesture of different kind is one of the most intuitive and common communication. still, vision- predicated hand gesture recognition is a challenging problem, which is involved complex computation, due to high degree of freedom in a mortal hand. In this paper, we use hand gesture captured by webcam rather of mice, for natural and intuitive mortal- computer commerce. Skin findings system is used to produce a segmented hand image and to separate with the background. outlines and convex casing algorithm is used to f<sup>^</sup>ete hand area as well as the number of fingertip of hand gesture image to be athwart colluded with button. also, for discovery of hand gesture stir. The result shows that this system can operate well so we can interact with a computer using our hand gesture rather using a mouse.

**Keywords:** Gesture Recognition, Human-Computer Interaction (HCI), Vision-Based Control, Hand Gesture Detection, Webcam-Based Input, Skin Segmentation, Contour Detection, Convex Hull Algorithm, Fingertip Detection, Gesture-Based Navigation, Mouse Replacement, Real-Time Interaction