Thammasat University Rangsit Campus, Pathum Thani, Thailand

Bharathi Women's College Chennai, Tamil Nadu

Annai College of Arts & Science, Kovilacheri, Kumbakonam

Samara University Semera, Ethiopia, East Africa

Jiadhal College Dhemaji, Assam, India

PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON

SCIENCE, TECHNOLOGY, ENGINEERING, MANAGEMENT, EDUCATION IN LAW AND MEDICAL SCIENCES - 2026

STEMEM-2K26 | MARCH 28- 29, 2026

EDITORS

Dr.S.Balamuralitharan

Dr.Sindhura Kannappan

Dr. K. Sujith

Dr. R. SANTHI DEVI

ORGANIZED BY

Chendur Research Foundation

Chennai, India

IN ASSOCIATION WITH

THAMMASAT UNIVERSITY
Rangsit Campus, Thailand

SAMARA UNIVERSITY
Semera, Ethiopia, East Africa

Annai College of Arts and Science
Kumbakonam, Tamil Nadu, India

Bharathi Women's College
Chennai, Tamil Nadu

Jiadhal College
Dhemaji, Assam, India

Proceedings of the

International Conference on Science, Technology, Engineering, Management, Education in Law and Medical Sciences – 2026

EDITORS

Dr.S.Balamuralitharan

Dr.Sindhura Kannappan

Dr. K. Sujith

Dr. R. SANTHI DEVI

CHENDUR PUBLICATIONS

Chennai

www.chendurph.com

International Conference on Science, Technology, Engineering, Management, Education in Law and Medical Sciences – 2026

First Edition: **Year 2026**

Edited by

Dr.S.Balamuralitharan

Dr.Sindhura Kannappan

Dr. K. Sujith

Dr. R. SANTHI DEVI

Chendur Publishing House, Chennai, India

Email: stemem2026@chendurph.com

ISBN: 978-81-996153-6-6

IN ASSOCIATION WITH

THAMMASAT UNIVERSITY
Rangsit Campus, Thailand

SAMARA UNIVERSITY
Semera, Ethiopia, East Africa

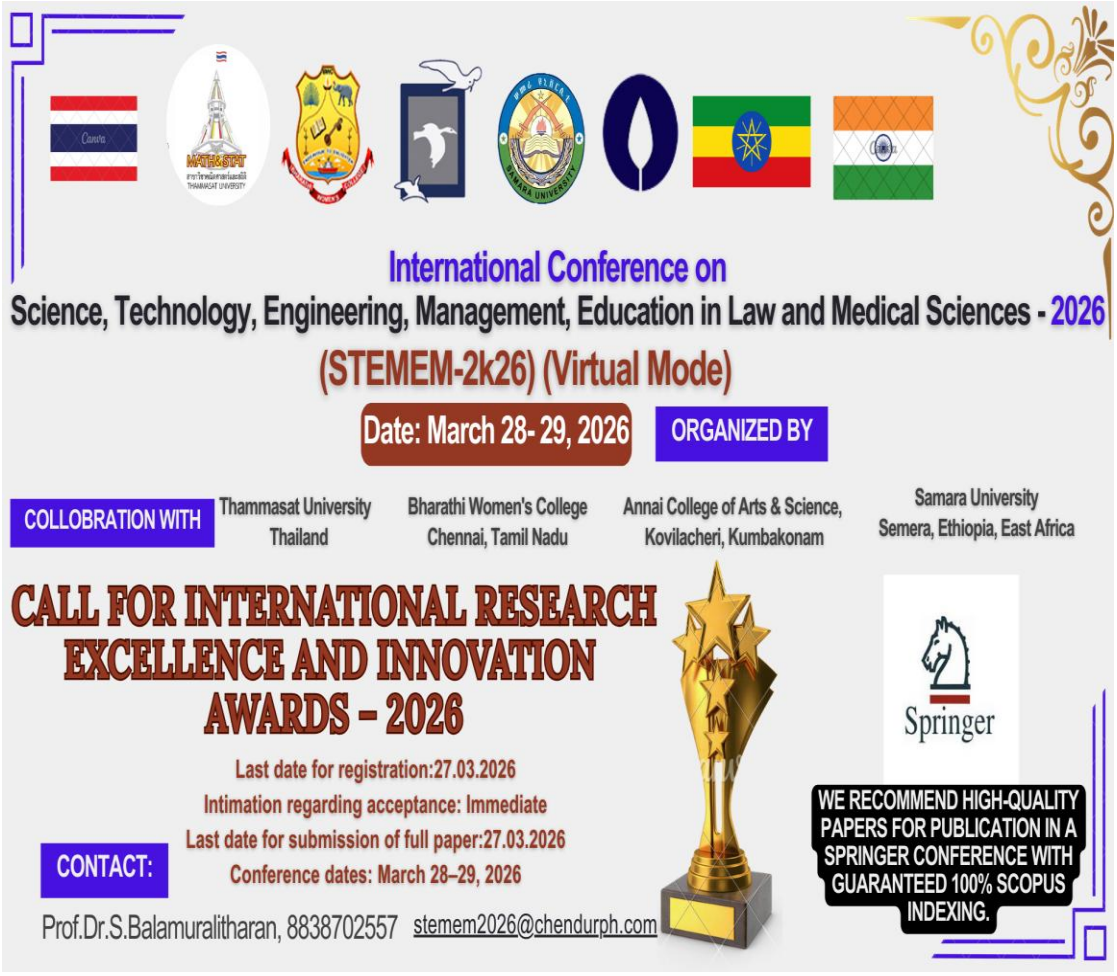
Annai College of Arts and Science
Kumbakonam, Tamil Nadu, India

Bharathi Women's College
Chennai, Tamil Nadu

Jiadhal College
Dhemaji, Assam, India

ORGANIZED BY

Chendur Research Foundation
Chennai, India



INDEX

PREFACE

Founded in 2015, Chendur Research Foundation (CRF) is dedicated to advancing knowledge through impactful research and academic excellence. The foundation supports innovation across various disciplines by conducting conferences and publishing high-quality research, including papers in Scopus-indexed journals. CRF continues to provide a platform for academicians, researchers, and industry professionals to collaborate and share their ideas.

The International Conference on Science, Technology, Engineering, Management, Education in Law and Medical Sciences – 2026 is organized by Thammasat University and CRF during March 28-29, 2026. The aim of this conference is to bring together global experts from academia and industry to exchange knowledge on emerging trends, research advancements, and practical implementations.

Stemem-2026 features keynote addresses and invited talks by distinguished speakers, along with virtual presentations from researchers around the world. The conference encourages faculty development, alumni engagement, and active participation from young researchers to promote new ideas and strengthen the academic and professional community.

We acknowledge the contribution of the associating institutions, experts, invited speakers, delegates and the conference committee members for their cooperation and excellent support in organizing this conference.

Best Wishes.

EDITORS

About Thammasat University

Thammasat University, home to the Ph.D. Program in Mathematics offered by the Department of Mathematics and Statistics, Faculty of Science and Technology, was inaugurated on June 27, 1934. The original name of the University, as given by Professor Dr. Pridi Banomyong, was the University of Moral and Political Sciences. Professor Dr. Banomyong wished to establish a university to educate Thai people of democracy introduced to the nation for the first time two years earlier.

True to the ideas of Professor Dr. Banomyong, the University of Moral and Political Sciences quickly became an open university that accepted everyone with a high school diploma and working people in general.

DR.S. BALAMURALITHARAN

Message

The Global Conference on Computational Mathematics and Intelligent Engineering Applications (GCCMIEA-2025) is organized by Thammasat University and CRF during December 27-29, 2025. The primary goal of this conference is to bring together experts and researchers from academia and industry to share their knowledge on implementations, to encourage faculty and researchers learn and develop new ideas from world-class excellence and to strengthen the institute through an alumni network.We believe that this conference will be a good platform for the young researchers from various fields.

DR. WUTIPHOL SINTUNAVARAT

Message

The Global Conference on Computational Mathematics and Intelligent Engineering Applications (GCCMIEA-2025) is a beacon of innovation and progress, bringing together experts and researchers to share knowledge and drive positive change. By fostering interdisciplinary collaboration and knowledge exchange, this conference has the potential to greatly benefit society by addressing real-world challenges, promoting innovative solutions, and nurturing the next generation of leaders. The insights and advancements presented here can lead to improved healthcare, sustainable technologies, effective management practices, and enriched cultural understanding, ultimately contributing to a more prosperous and enlightened world.

DR. K. SUJITH

Message

I am delighted to be part of the Global Conference on Computational Mathematics and Intelligent Engineering Applications (GCCMIEA-2025). This esteemed event offers a valuable platform for sharing insights and pioneering ideas that advance the fields of computational mathematics and intelligent engineering. I extend my best wishes to the organizers, participants, and delegates for a highly successful conference, and I hope it becomes a truly enriching and impactful experience for all.

DR. R. SANTHI DEVI

Message

It is with great pride and enthusiasm that I welcome all participants, distinguished speakers, researchers, and professionals to the Global Conference on Computational Mathematics and Intelligent Engineering Applications (GCCMIEA-2025). Organized by Thammasat University in association with Chendur Research Foundation, Annai College of Arts & Science, Kumbakonam, and Bharathi Women's College, Chennai, this conference provides a dynamic platform to explore innovative research and emerging technologies in computational mathematics and intelligent engineering. I am confident that the ideas shared and collaborations formed here will inspire meaningful advancements and contribute significantly to the global scientific and engineering community. Wishing everyone a productive and enriching conference experience.

Conference Committees

Conference Chair

Dr.S.Balamuralitharan , Chendur Publishing House, Chennai

Convener

Dr. Sindhura Kannappan,

Assistant Professor, MEASI Institute of Management

Dr. Shubhendu Shekher Shukla,

Associate Professor, Dept. of Business Administration, SRM Business School, Lucknow

Senior Scientific Committee

Prof. Dr. Hijaz Ahmad, Near East University, Turkey

Dr. B. Chitradevi, SRM IST, India

Prof. Jung Rye Lee, Daejin University, South Korea

Prof. Ahmet Sinan Cevik, Selcuk University, Turkey

Dr. Veena Rao, Texas A&M University, USA

Prof. Bhawani Sankar Panda, IIT Delhi

Prof. OM Prakash, IIT Patna

Prof. Soner Nandappa, Mysore University

Prof. Mehmet Topcuoglu, Istanbul Technical University

Dr. Nilam D. Bhatt, SVNIT Surat, India

Prof. Dimitrios Tzovaras, Aristotle University, Greece

Prof. Angelos Bilas, University of Patras, Greece

Prof. Andreas Dengel, German Research Center for AI, Germany

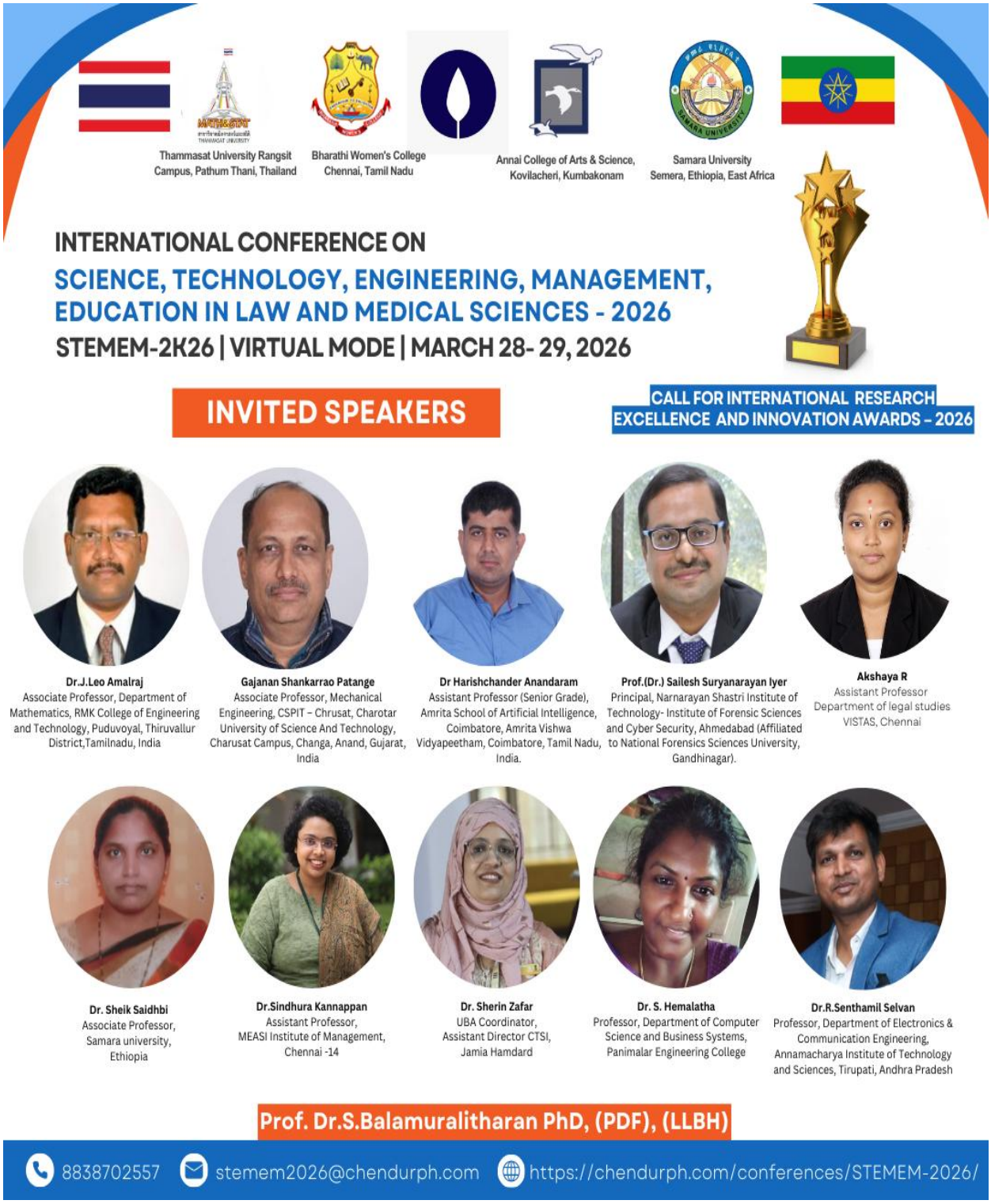
Dr. Ana F. Braga, University of Coimbra, Portugal

Prof. Ramesh Singh, IIT Roorkee, India

Mr. Irshadullah Asim Mohammed, Supply Chain, Project Manager,

FuelCell Energy Inc., Connecticut, USA

KEYNOTE SPEAKERS & INVITED TALKS



LIST OF PAPERS PRESENTED

Abstract No.	Title
A1	A Descriptive Study To Assess The Social Connectedness, Social Support And Life Satisfaction Among Adults Residing At Selected Urban Area, Chennai **Indira Marimuthu, Shankar Shanmugam Rajendran, Vanitha Narayanasamy**
A2	Bioinformatics-Guided Precision Dosing: Redefining Clinical Pharmacy in the Omics Era **Dr. Mekkanti Manasa Rekha**
A3	From Population Models to Predictive Intelligence: Machine Learning–Integrated Pharmacometrics in Clinical Pharmacy-A Systematic Review and Meta-Analysis of Real-World Precision Therapeutics **Dr. Mekkanti Manasa Rekha**
A4	Comparative Analysis of CNN and YOLO-v12 Architectures for Lesion Detection and Stage Classification of Non-Proliferative Diabetic Retinopathy **Dr. Kishor S. Wagh, Pratik Chemate, Anushka Kalpund**
A5	A Study on Transformation from E-Commerce To Q-Commerce **Leesha Dhall, Kunal**
A6	Efficient Client-Side Deduplication of Encrypted Data with Public Auditing in Cloud Storage **B Pravallika, Kusuma Siddhartha, Kamutala Sumanth, Banda Srinath**
A7	A Reactive RAG Framework for Developer Portfolios using MongoDB Change Streams and Google Gemini **Dr. A karthik, B.V.Brahmananda reddy, Sadu vishwanath Reddy, Penumudi Datta Jagan Mohan**
A8	Enhancement of Security and Visual Quality in Image Steganography **Ms. N Venkata Sireesha, Ganta Sai Lakshmi Sravani, Padavala Lavanya sri, Gurujala Nikitha**
A9	Optimized Breast Cancer Classification Using An Adaptive Voting Ensemble Learning Algorithm **Dr. A. KrishnaChaitanya, D.Keerthi Sri, G. Deekshitha, M. Sathwik**
A10	Fraud Detection in Financial Transactions Using Advance Analytical techniques **Rama Devi Burri, Manishree Patlola, Srivalli Parveda, Varsha Emmadi**
A11	Image Deconvolution by Learning Gradient Descent Optimization Techniques **Dr. Rama Devi Burri, Godugu Sai Vikas, Govvula Sravanthi, Angari Vaishnavi**

A12	Investigating the therapeutic efficacy of Ficus Carica Fruit Extract against Lung cancer A459 cell line **Sana Vijayalakshmi, Thippannagari Lokesh, Dr. Arihara sivakumar Ganesan,, Dr. Seema Kalra,**
A13	A Modern E-Evaluation Approach for Conducting Exams for Visually Challenged Candidates **Vinesh Gone, Chakali Jupally Ramesh, Ramagiri Puunit, Sirasanavada Sri Sai**
A14	Waste-to-Resource Approach for Heavy Metal Removal from Industrial Effluents **Maruwada Srinivasan, Ramprasad Naik Desavathu, Rakesh Roshan Dash.**
A15	Organic Thin-Film Transistors for Biosensing Applications: Advances and the Role of Dielectric-Modulated OTFT **Somvir jakher, and Rekha Yadav**
A16	ImageDC: Image Data Cleaning Framework Based on Deep Learning **Gaddam Srinath, B.Pravallika, Kuntala Vinay Kumar , Sokki Rishi Vardhan**
A17	SURROGACY REGULATION IN INDIA **Sobhana Verma, Vishwa Deepak Bhatnagar**
A18	Phytochemical Screening, In Vitro Antioxidant and Anti-inflammatory Efficacy of Anisomeles indica (L.) Kuntze **Anu C Benny, and Sheeja T Tharakan**
A19	Comparative Analysis of Phytochemical Composition in Leaf and Bark Extracts of Poeciloneuron indicum Bedd. **Anjana Unni, Sheeja T Tharakan1,**
A20	Preliminary Qualitative and Quantitative Phytochemical Analysis of Gynochthodes umbellata (L.) Razafim. & B. Bremer **Sarika S Nair, Sheeja T Tharakan1**
A21	Image based authentication using zero knowledge protocol with multi factor authentication **David Raj. G , Mohammed Ishaqe Ali. A, Mohamed Kaif. A**
A22	Formulation of Herbal Tea and Its Antioxidant Potential **Sheeja T Tharakan**
A23	Spectral Discrimination And Separable Analysis of Crops And Weeds Using Deep learning technique **Dr. M. Purushottam Reddy, Chadive Tejawsini Reddy, Edulukanti Vinay Kumar,Jatothu Sindhu Rathod**

A71	AI-Based Health Monitoring system for Rubber Cultivation. **Avurupalli Manikanta, Mrs. N. Renu**
A72	Service desk ticket classification using deep learning **Madhu Ilavarapu, Dr.Ch.Swapna Priya**

The **International Conference on Science, Technology, Engineering, Management, Education in Law and Medical Sciences (STEMEM-2026)**

ISBN: 978-81-996153-6-6

STEMEM-2026_A1

A DESCRIPTIVE STUDY TO ASSESS THE SOCIAL CONNECTEDNESS, SOCIAL SUPPORT AND LIFE SATISFACTION AMONG ADULTS RESIDING AT SELECTED URBAN AREA, CHENNAI

Indira Marimuthu, Shankar Shanmugam Rajendran, Vanitha Narayanasamy

College of Nursing,Madras Medical College,Chennai-03.

indra26789marimuthu@gmail.com

ABSTRACT

Introduction: Adulthood, particularly midlife (45–59 years), is a critical phase often marked by heightened psychosocial stress, social isolation, and declining well-being. Social connectedness and support are known to influence life satisfaction and psychological resilience, yet limited studies have explored their interrelationships in Indian urban settings. Addressing this gap, the present study investigates the levels and interrelations of social connectedness, perceived social support, and life satisfaction among adults.

Objectives: The study is aimed to assess the level of social connectedness, social support, and life satisfaction among adults.

Methods and Materials: This study used a quantitative, descriptive design was used with 60 adults aged 45–59 years selected via non-probability convenience sampling. Validated tools included the Social Connectedness Scale (SCS), Multidimensional Scale of Perceived Social Support (MSPSS) and Life Satisfaction Questionnaire-11 (LISAT-11), with high reliability (Cronbach's alpha > 0.84). Data were analyzed using SPSS, applying descriptive statistics for distribution and Chi-square tests for associations. A pilot study ensured feasibility and ethical protocols including informed consent were strictly followed.

Results: The majority of participants had moderate social connectedness (68.33%), moderate or low support (36.67% each), and low life satisfaction (71.67%). Positive moderate correlations were found between connectedness, support, and life satisfaction (r = 0.42–0.47, p = 0.01). Education was significantly associated with all three variables (p < 0.01), and income and family structure also showed significant associations.

Conclusion: The study underscores the importance of education, income, and social structure in influencing psychosocial well-being. Strengthening social networks and enhancing support systems may be key to improving life satisfaction among urban midlife adults.

Keywords: Social connectedness, Social support, Life satisfaction, Midlife adults, Psychosocial well-being

ISBN: 978-81-996153-6-6

STEMEM -2026_A2

Bioinformatics-Guided Precision Dosing: Redefining Clinical Pharmacy in the Omics Era

Dr. Mekkanti Manasa Rekha

Abstract

Abstract

The integration of omics sciences with bioinformatics has fundamentally reshaped the landscape of clinical pharmacy, enabling a shift from empirical dosing strategies to evidence-driven precision dosing. Genetic, proteomic, and metabolomic variability significantly influence drug response, yet conventional dosing frameworks often fail to capture this complexity. This narrative-based clinical research synthesis explores the role of bioinformatics-guided precision dosing in advancing personalized pharmacotherapy.

This study synthesizes evidence from clinical trials, observational studies, and real-world implementations that employed bioinformatics tools to interpret omics data for dose optimization. Emphasis was placed on pharmacogenomics-guided dosing, algorithm-driven therapeutic drug monitoring, and integrative clinical decision-support systems led by clinical pharmacists.

Findings consistently demonstrate that bioinformatics-enabled precision dosing improves therapeutic efficacy, reduces adverse drug reactions, and enhances medication safety, particularly in chronic disease management and oncology. Clinical pharmacists trained in omics interpretation emerged as pivotal contributors to interdisciplinary healthcare teams, translating complex molecular data into actionable clinical recommendations.

The transition toward bioinformatics-guided dosing not only enhances patient outcomes but also supports sustainable healthcare by reducing treatment failures, hospital readmissions, and economic burden. As the omics era continues to evolve, redefining the role of clinical pharmacists through advanced bioinformatics competency is essential for the successful implementation of precision medicine.

This work underscores the necessity of integrating bioinformatics and omics education into clinical pharmacy practice to meet the future demands of personalized and sustainable healthcare.

Keywords: Bioinformatics, Precision Dosing, Omics, Pharmacogenomics, Clinical Pharmacy, Personalized Medicine

ISBN: 978-81-996153-6-6

STEMEM -2026_A3

From Population Models to Predictive Intelligence: Machine Learning–Integrated Pharmacometrics in Clinical Pharmacy-A Systematic Review and Meta-Analysis of Real-World Precision Therapeutics

Dr. Mekkanti Manasa Rekha

Associate Professor

Department of Pharmacy Practice

Aditya Bangalore Institute of Pharmacy Education and Research

Bangalore, Karnataka, India

manasarekharoyal@gmail.com

Abstract

The evolution of clinical pharmacy from traditional population-based dosing toward individualized precision therapeutics has been accelerated by advances in artificial intelligence (AI) and machine learning (ML). Pharmacometrics, traditionally grounded in population pharmacokinetic–pharmacodynamic (PK–PD) models, is now transitioning into predictive intelligence frameworks capable of integrating real-world data (RWD) for patient-specific decision-making. This systematic review and meta-analysis aimed to evaluate the clinical impact, methodological robustness, and translational value of ML-integrated pharmacometric approaches in precision therapeutics.

A systematic literature search was conducted across PubMed, Scopus, Web of Science, and Embase, focusing on studies published between 2015 and 2025 that applied ML techniques alongside pharmacometric modeling in clinical pharmacy settings. Eligible studies included real-world clinical data, therapeutic drug monitoring, or outcome-driven precision dosing interventions. Data were synthesized using random-effects meta-analysis, with outcomes assessed in terms of dosing accuracy, therapeutic target attainment, adverse drug event reduction, and clinical outcomes.

Across the included studies, ML-augmented pharmacometric models demonstrated significantly improved prediction accuracy compared to conventional population models, particularly in heterogeneous patient populations. Notable improvements were observed in dose individualization, time-to-therapeutic range, and reduction of drug-related toxicity. Importantly, these approaches also supported sustainable healthcare practices by optimizing resource utilization and minimizing trial-and-error dosing.

This review highlights the transformative role of AI-enabled pharmacometrics in clinical pharmacy practice, positioning pharmacists as key stakeholders in data-driven precision medicine. Integrating predictive intelligence into routine clinical workflows represents a sustainable and scalable pathway toward safer, more effective, and personalized therapeutics.

Keywords: Artificial Intelligence, Machine Learning, Pharmacometrics, Precision Therapeutics, Clinical Pharmacy, Real-World Data

ISBN: 978-81-996153-6-6

STEMEM -2026_A4

Comparative Analysis of CNN and YOLO-v12 Architectures for Lesion Detection and Stage Classification of Non-Proliferative Diabetic Retinopathy

Dr. Kishor S. Wagh

Dept. of Computer Engineering

AISSMS INSTITUTE OF INFORMATION TECHNOLOGY

Pune, India

kishorwagh@gmail.com

Pratik Chemate

Dept. of Computer Engineering

AISSMS INSTITUTE OF INFORMATION TECHNOLOGY

Pune, India

pratikchemate@gmail.com

Anushka Kalpund

Dept. of Computer Engineering

AISSMS INSTITUTE OF INFORMATION TECHNOLOGY

Pune, India

anushkakalpund@gmail.com

Abstract

Diabetic Retinopathy (DR) is one of the major side effects of diabetes and is ranked among the leading causes of reversible global blindness. Identifying the stages, especially Non-Proliferative Diabetic Retinopathy (NPDR), is very instrumental in a manner that the disease does not progress and vision does not become irreversible. This work showcases the comparison of the two deep learning models, CNN and YOLO-v12, in terms of their effectiveness in lesion localization and stage classification of NPDR from retinal fundus images. The sources of the datasets were IDRiD and Roboflow. The preprocessing of images was done by Contrast Limited Adaptive Histogram Equalization (CLAHE) and data augmentation to make lesions more visible and to solve the problem of the class of lesions being underrepresented. The CNN model multi-class classification of NPDR stages (mild, moderate, severe) only is done by the CNN model, whereas the YOLO-v12 model is used for the detection of retinal lesions like microaneurysms, hemorrhages, and exudates etc. in real-time. Effectiveness of models was measured by the use of Accuracy, Precision, Recall, F1-Score, and mean Average Precision (mAP). The comparison results show that YOLO-v12 is more efficient than CNN in locating lesions in real-time while CNN is able to classify the overall stages with a higher degree of stability. The application of both methods simultaneously paves the way for a hybrid diagnostic framework that not only enables early screening but also provides clinical decision-making support. The work presented is a step toward realizing a deep learning-based, interpretable, and resource-efficient system for analyzing ophthalmic diseases and telemedicine.

Keywords—Diabetic Retinopathy, Non-Proliferative Diabetic Retinopathy, CNN, YOLO-v12, Lesion Detection, Fundus image, Comparative study.

ISBN: 978-81-996153-6-6

STEMEM -2026_A5

A Study on Transformation from E-Commerce To Q-Commerce

Author

Leesha Dhall, Kunal

leesha05dhall@gmail.com ; kunallochab11@gmail.com

B.Com (Hons), 3rd Year Students

SRM University, Delhi NCR, India

SRM University, Delhi NCR, Rajiv Gandhi Education City, Sonipat – 131029

Abstract

The retail industry has experienced a rapid digital transformation, evolving from traditional store-based shopping to e-commerce and now to quick commerce (Q-commerce), where products are delivered within minutes. This shift reflects changing consumer expectations, particularly the growing importance of speed, convenience, and immediacy in everyday purchases. The present study investigates the transition from e-commerce to Q-commerce in the Indian context by examining consumer preferences, behavioral patterns, and demographic influences affecting platform usage. The research follows a descriptive quantitative design based on primary data collected through a structured questionnaire distributed via Google Forms. A total of 105 respondents familiar with both e-commerce and Q-commerce platforms participated in the survey using convenience sampling. Reliability of the instrument was tested using Cronbach's Alpha (0.922), indicating high internal consistency. Statistical analysis was conducted using Independent Samples t-test and One-Way ANOVA to determine significant differences across demographic variables such as age, gender, and employment status. The findings reveal that the main drivers of Q-commerce adoption are faster delivery and the convenience of fulfilling immediate needs, with groceries and daily essentials being the most frequently ordered products. The results also show statistically significant variations in platform preference across demographic groups. Despite increasing popularity, certain limitations persist: high delivery charges and limited discounts were identified as the major barriers to frequent usage. While a majority of respondents consider Q-commerce sustainable in the long term, many consumers continue to rely on both models simultaneously, using Q-commerce for urgent purchases and traditional e-commerce for planned and variety-based shopping. The study concludes that Q-commerce isn't replacing e-commerce but functioning as a complementary retail channel shaped by urgency-based consumption. For sustainable growth, platforms must focus on affordability, wider product assortment, and consistent delivery reliability. The research contributes to understanding evolving consumer behavior in hyperlocal delivery ecosystems and offers practical insights for businesses and marketers developing strategies in the emerging instant-delivery economy.

Keywords: Quick Commerce, E-commerce, Consumer Behavior, Instant Delivery, Digital Retail, Hyperlocal Logistics

ISBN: 978-81-996153-6-6

STEMEM-2026_A6

Efficient Client-Side Deduplication of Encrypted Data with Public Auditing in Cloud Storage

Authors

Ms. B Pravallika Assistant Professor

Institute Of Aeronautical Engineering (IARE)

Dundigal, Hyderabad, Telangana, India b.pravallika@gmail.com

Kusuma Siddhartha

Institute Of Aeronautical Engineering (IARE)

Dundigal, Hyderabad, Telangana, India siddharthakusuma44@gmail.com

Kamutala Sumanth

Institute Of Aeronautical Engineering (IARE)

Dundigal, Hyderabad, Telangana, India kamutalasumanth123@gmail.com

Banda Srinath

Institute Of Aeronautical Engineering (IARE)

Dundigal, Hyderabad, Telangana, India srinathbanda@gmail.com

Abstract

ABSTRACT: Users can store large extent of data cheaply using cloud storage services and in most cases, there are two significant challenges in these services, which include duplication of files and problems of data integrity. Duplication of files uses unneeded storage space, and data stored on the far off servers seems to raise an issue whether the data has been modified by the third parties or not. The proposed solution to both problems is a secure homomorphic authentication algorithm based on BLS (BonehLynnShacham) signature schemes in form of a linear homomorphic authenticator which is described in this paper. Users can use this technique to detect file duplication/check file integrity without the need to access the content or encryption key; they can do this directly on encrypted data. The system has three significant elements; the user, The cloud server and the third-party auditor (TPA) (CSS). The user loads files created with encryption, the CSS searches the uniqueness of the files and the TPA simplifies file integrity without having access to the original information. The suggested system is secure, space-saving, and does not allow attacks by insiders and outsiders.

Keywords: Cloud Storage, Data Deduplication, File Integrity, BLS Signature, Homomorphic Encryption, Third-Party Auditor, Data Security, Encrypted File Verification, Public Auditing, Client-Side Deduplication.

ISBN: 978-81-996153-6-6

STEMEM -2026_A7

A Reactive RAG Framework for Developer Portfolios using MongoDB Change Streams and Google Gemini

Authors

Dr. A karthik

Information Technology(IT)

Institute Of Aeronautical Engineering

Hyderabad,India a.karthik@iare.ac.in

B.V.Brahmananda reddy

Information Technology(IT)

Institute Of Aeronautical Engineering Hyderabad,India brahmanandamreddy18@gmail.com

Sadu vishwanath Reddy

Information Technology(IT)

Institute of Aeronautical Engineering Hyderabad,India saduvishwanath95@gmail.com

Penumudi Datta Jagan Mohan

Information Technology(IT)

Institute Of Aeronautical Engineering Hyderabad,India dattajaganpenumudi@gmail.com

Abstract

Abstract—This paper presents the design and implementation of a portfolio-centric conversational agent embedded within a modern web portfolio. The system integrates a Next.js 15 frontend with an Express.js–MongoDB backend and a retrieval-augmented generation (RAG) pipeline powered by Google Gemini for answer synthesis. The contribution lies in a pragmatic end-to-end architecture for personal-knowledge assistants: (i) a floating chatbot UI with polished UX, (ii) a flexible vector layer with both in-memory similarity and ChromaDB pathways, (iii) automated embeddings refresh using MongoDB Change Streams to keep knowledge up to date as portfolio content changes, and (iv) per-IP rate-limited, logged interactions for analytics. We report design choices, implementation details, and practical considerations for reliability, maintainability, and developer ergonomics. We conclude with a discussion on limitations and opportunities for extending the platform to multi-modal and enterprise contexts.

Keywords—Retrieval-Augmented Generation, Conversational AI, Next.js, MongoDB Change Streams, ChromaDB, Gemini, Vector Search.

ISBN: 978-81-996153-6-6

STEMEM -2026_A8

Enhancement of Security and Visual Quality in Image Steganography

Ms. N Venkata Sireesha

Assistant Professor, Dept. of IT

Institute Of Aeronautical Engineering Hyderabad, India

sireeshagireesh@gmail.com

Ganta Sai Lakshmi Sravani

Btech Student, Dept. of IT

Institute Of Aeronautical Engineering Hyderabad, India

gantasravani119@gmail.com

Padavala Lavanya sri

Btech Student, Dept. of IT

Institute Of Aeronautical Engineering Hyderabad, India

lavanya.padavala42@gmail.com

Gurujala Nikitha

Btech Student, Dept. of IT

Institute Of Aeronautical Engineering Hyderabad, India

nikithagurujala143@gmail.com

Abstract: Nowadays in the era of electronic media it is very critical to protect and conceal information. The project makes it better how we conceal confidential information in pictures through a system called image steganography. The idea is to ensure that, the concealed information remains secure and yet the image portrays as being normal and intact to the human eye. We are employing smart algorithms, encryption and the use of technologies such as Python based OpenCV and NumPy to conceal the data in such manner that no intruder can quickly recognize. A web based platform is also a part of the system as the users can transfer images easily as well as embed data and download data as it is secure. The method can be used to achieve high security and decent visual quality, thus, it is applicable in the real world such as encrypted communication or encrypted file sharing.

Keywords: Image Steganography, Visual Quality, Data Hiding, Encryption, LSB, Python, OpenCV, Web Application, Steganalysis Resistance, Secure Communication.

ISBN: 978-81-996153-6-6

STEMEM -2026_A9

Optimized Breast Cancer Classification Using An Adaptive Voting Ensemble Learning Algorithm

Dr. A. KrishnaChaitanya

Asst. Professor

Information TechnologyInstitute of Aeronautical Engineering

Dundigal, Hyderabad

a.krishnachaitanya@iare.ac.in

D.Keerthi Sri

Information TechnologyInstitute of Aeronautical Engineering

Dundigal, Hyderabad

keerthisri1232@gmail.com

G. Deekshitha

Information TechnologyInstitute of Aeronautical Engineering

Dundigal, Hyderabad

deekshithagoud12@gmail.com

M. Sathwik

Information TechnologyInstitute of Aeronautical Engineering

Dundigal, Hyderabad

sathwikc36@gmail.com

Abstract

— Breast cancer is still one of the leading causes of death for women globally, which emphasizes the need of prompt and precise detection. When faced with complicated tumor shape and varied medical data, traditional machine-learning techniques frequently suffer from decreased accuracy. In order to improve classification performance for breast cancer detection, this study suggests an adaptive voting ensemble learning method. The ensemble combines many base classifiers, including K-Nearest Neighbors (KNN), Support Vector Machine (SVM), and Decision Tree, and gives each model dynamic weights according to how well it performs during validation. The model was assessed using the Wisconsin Breast Cancer Dataset (WBCD), and accuracy, precision, recall, F1-score, and ROC-AUC were compared to individual classifiers. According to experimental data, the adaptive voting ensemble outperforms solo models in terms of accuracy and resilience.The approach provides a reliable computational framework that can support clinical decision-making and improve early detection outcomes.

Keywords- Breast Cancer Classification, Adaptive Voting, Ensemble Learning, Machine Learning, Wisconsin Breast Cancer Dataset (WBCD), Decision Tree, Support Vector Machine (SVM), K-Nearest Neighbors (KNN), Medical Diagnosis, Predictive Modeling

ISBN: 978-81-996153-6-6

STEMEM -2026_A10

Fraud Detection in Financial Transactions Using Advance Analytical techniques

Rama Devi Burri

Professor

Institute Of Aeronautical Engineering ramaburri5@gmail.com

Manishree Patlola

Institute Of Aeronautical Engineering

patlolamanishree@gmail.com

Srivalli Parveda

Institute Of Aeronautical Engineering

vpsssripad@gmail.com

Varsha Emmadi

Institute Of Aeronautical Engineering

varshaemmadi086@gmail.com

Abstract

Transactions have witnessed a substantial increase due to the rapid development in technology and e- commerce, leading to an increase in banking fraud and financial losses. To detect the fraudulent transactions, there is a requirement to overcome the problem of imbalanced data by class weight tuning, which is optimized by Bayesian hyperparameter optimization. To enhance the efficiency of the model and make it unbiased, this preprocessing method is very effective. To evaluate the efficiency of two highly effective gradient boosting models, XGBoost and LightGBM, the majority voting ensemble learning method is used. The experimental outcome on real-world datasets proves to be highly effective, and the application of deep learning for hyperparameter optimization further enhances the efficiency of the model, reaching a level that can enhance security with the help of Blockchain technology, ensuring data integrity and secure management of transactions, making the system more trustworthy.

Key words—Fraud Detection, Credit Card Transactions, Class Imbalance, XGBoost, LightGBM, Ensemble Learning, Bayesian Optimization, Blockchain Security.

ISBN: 978-81-996153-6-6

STEMEM -2026_A11

Image Deconvolution by Learning Gradient Descent Optimization Techniques

Dr. Rama Devi Burri

Professor

Institute Of Aeronautical Engineering (IARE)

Dundigal, Hyderabad,Telangana,India

ramaburri5@gmail.com

Godugu Sai Vikas

Institute Of Aeronautical Engineering (IARE)

Dundigal,Hyderabad,Telangana, India

saivikassaivikas80@gmail.com

Govvula Sravanthi

Institute Of Aeronautical Engineering (IARE)

Dundigal,Hyderabad,Telangana,India

govulasravanthi01@gmail.com

Angari Vaishnavi

Institute Of Aeronautical Engineering (IARE)

Dundigal,Hyderabad,Telangana,India

aangarivaishnavi@gmail.com

Abstract

Abstract: One powerful method for improving visual images and sharpening them is image deconvolution and sharpening. In this work, we present a novel deep learning technique called Gradient Descent Optimisation Network (GDON), which relies on image blur removal. Our method uses a convolutional neural network (CNN) that mimics the gradient descent technique to learn how to refine images, as opposed to depending on manually created assumptions or rules. The GDON model is trained using a set of paired images that are both blurred and sharpened. The model learns to enhance an image's quality over a number of iterations without requiring manual parameter remapping. Now that the model has been trained, it can be used to restore clarity to any other unaltered blurred image. Modules for uploading datasets, training models, and testing with real-time output generation modules make up our system. According to research findings, the GDON framework performs well and accurately, with improved PSNR and SSIM measurements and the best usage recommendations in a real-world image deblurring use case.

Keywords - Image Deconvolution, Deep Learning, GDON, Gradient Descent, CNN, Blur Removal, PSNR, SSIM, Image Restoration, Pascal VOC Dataset.

ISBN: 978-81-996153-6-6

STEMEM -2026_A12

Investigating the therapeutic efficacy of Ficus Carica Fruit Extract against Lung cancer A459 cell line

Sana Vijayalakshmi,

Department of Biochemistry, School of Life sciences, IGNOU, New Delhi, India

Thippannagari Lokesh,

Department of Medical Sciences, NIEPID, Secunderabad, Telangana, India

Dr. Arihara sivakumar Ganesan,

Department of Pharmacology, KMCH College of Pharmacy, Dr. M.G.R. Medical University, Coimbatore,

Tamil nadu, INDIA,

Dr. Seema Kalra,

Assistant Professor, Department of Biochemistry, School of Life sciences, IGNOU, New Delhi, India

Abstract

Ficus carica L., (family Moraceae) commonly known as the figs, are highly prized globally for their fresh and dried forms. Figs have medicinal applications and are used in traditional remedies.

This study primarily evaluated the FCF composition, bioactivity by using HPTLC, DPPH, ABTS, H2O2 free radical assays, GC-MS analysis and MTT assays. Also evaluated the parameters such as identification and improvement of bioactive compounds in normal and fermented FCF extracts antioxidant, chemo preventive, Anti-inflammatory and anticancer nature and cytotoxic effects of FCF extracts on lung cancer A459 cell lines. Key compounds identified in both of the extracts, include phenolics, phytosterols, tri terpenoids, anthocyanins and volatile components. These biomolecules have shown antioxidant, anti-inflammatory and anticancer properties. Fermentation for 7 days showed limited improvement in antioxidant activity. The extracts demonstrated enhanced cytotoxicity in lung cancer cell lines A459.These findings validate traditional medicinal applications and highlight the relationship between phytochemicals and key metabolic processes, including apoptosis and lipid peroxidation. FCF can also effectively target cancer cells with minimal side effects.

Key words: Lung cancer, Ficus fruit extract, antioxidants, Bioactive compounds, chemotherapy, apoptosis

ISBN: 978-81-996153-6-6

STEMEM -2026_A13

A Modern E-Evaluation Approach for Conducting Exams for Visually Challenged Candidates

Vinesh Gone

I. Information Technology

Institute Of Aeronautical Engineering Hyderabad, India

g.vinesh@iare.ac.in

Chakali Jupally Ramesh

Information Technology

Institute Of Aeronautical Engineering Hyderabad, India

22951a1269@iare.ac.in

Ramagiri Puunit

Information Technology

Institute Of Aeronautical Engineering Hyderabad, India

22951a1266@iare.ac.in

Sirasanavada Sri Sai

Information Technology

Institute Of Aeronautical Engineering Hyderabad, India

22951a1297@iare.ac.in

Abstract

Visually challenged students often depend on human scribes to take exams, which limit their independence and privacy. This project introduces a new voice-based examination system that allows visually impaired candidates to take tests without any human help. The system uses text-to-speech (TTS) to read out multiple-choice questions and speech recognition (SR) to understand the candidate's spoken answers. It is built using Python, Django, and MySQL, and works with a microphone and speaker. Candidates can register, listen to questions, give answers by voice, and get their results automatically. Administrators can manage questions, monitor performance, and view results using a web interface. This solution helps create a fair, private, and accessible exam system for visually impaired users.

Keywords

Visually Challenged, Voice-Based Exam, E-Evaluation, Text-to-Speech (TTS), Speech Recognition, Inclusive Education, Accessible Testing, Django Framework, Python 3.7, MySQL, Assistive Technology

ISBN: 978-81-996153-6-6

STEMEM -2026_A14

Waste-to-Resource Approach for Heavy Metal Removal from Industrial Effluents

Maruwada Srinivasan1; Ramprasad Naik Desavathu2, Rakesh Roshan Dash3

1.Research Scholar, Dept. of Civil Engineering, Gandhi Institute of Engineering and Technology University, Gunupur, Odisha, India. Email: srinivasan.maruwada@giet.edu

2. Professor, Dept. of Civil Engineering, Gandhi Institute of Engineering and Technology University, Gunupur, Odisha, India. Email: dnaik@giet.edu

3 Associate Professor, Dept. of Civil Engineering, VSSUT Burla, Sambalpur, Odisha, India, Email: rrdash@gmail.com

Abstract

Industrial wastewater often contains hazardous heavy metals such as lead (Pb), cadmium (Cd), chromium (Cr), and nickel (Ni), which pose serious threats to the environment and human health. Conventional treatment methods are generally expensive and produce secondary pollution. Therefore, developing sustainable and low-cost treatment techniques has become an important research focus. The present study explores a waste-to-resource approach for the removal of heavy metals from industrial effluents using waste-derived adsorbent materials. Industrial by-products such as red mud, fly ash, and other waste materials possess high adsorption capacity due to their porous structure, large surface area, and presence of active functional groups. These materials can effectively adsorb toxic metal ions from contaminated wastewater through physical and chemical adsorption mechanisms.

In this study, adsorption experiments were conducted under different conditions such as pH, contact time, adsorbent dosage, and initial metal concentration to evaluate the efficiency of the waste-derived adsorbents. The results indicate that these low-cost materials demonstrate significant potential for removing heavy metals from industrial wastewater with high efficiency. The adsorption process was further analyzed using adsorption isotherm and kinetic models to understand the mechanism of metal ion removal.

The findings highlight that the utilization of industrial waste materials as adsorbents not only provides an economical and environmentally friendly solution for wastewater treatment but also contributes to sustainable waste management by converting waste into valuable resources. This waste-to-resource strategy offers a promising approach for effective heavy metal remediation in industrial wastewater treatment systems.

Keywords:- Red mud; Lead adsorption; Thermal activation; Industrial wastewater; Adsorption isotherms; Langmuir model; pH effect; Waste valorization

ISBN: 978-81-996153-6-6
STEMEM -2026_A15

Organic Thin-Film Transistors for Biosensing Applications: Advances and the Role of Dielectric-Modulated OTFT

Somvir jakher1* and Rekha Yadav2
1*ECE, DCRUST, Murthal, India, 131039, Haryana, India.
2ECE, DCRUST, Murthal, India, 131039, Haryana, India.
***Corresponding author(s). E-mail(s): somvirjakher@gmail.com;**
Contributing authors: rekha_7r@yahoo.co.in;

Abstract

Organic thin-film transistors (OTFTs) have significant potential for future portable, lightweight, and efficient biosensors due to their ability to enable rapid, uncomplicated detection compared to traditional tests. Many sectors, such as environmental monitoring, DNA testing, sports surveillance, agriculture, the maritime industry, food pathogen and adulterant detection, healthcare diagnosis, and Internet of Things (IoT)-based applications, have shown significant interest in biosensors. The article briefly addresses organic semiconductors and their charge-transport models, including VRH, MTR, and polaron models. It also presented different fabrication procedures of OTFTs. Furthermore, applications based on organic electrochemical transistors (OECT) and dielectric-modulated (DM) OTFT are discussed.

Keywords: Organic Thin-Film Transistors, efficient biosensors, DNA testing, sports surveillance, agriculture, the maritime industry, food pathogen.

ISBN: 978-81-996153-6-6

STEMEM -2026_A16

ImageDC: Image Data Cleaning Framework Based on Deep Learning

Gaddam Srinath
Information Technology(IT)Department
Institute of Aeronautical Engineering
Hyderabad, India
srinathgaddam41@gmail.com

B.Pravallika
Information Technology(IT)Department
Institute of Aeronautical Engineering
Hyderabad, India
b.pravallika@iare.ac.in

Kuntala Vinay Kumar
Information Technology(IT)Department
Institute of Aeronautical Engineering
Hyderabad, India
kuntalavinaykumar857@gmail.com

Sokki Rishi Vardhan
Information Technology(IT)Department
Institute of Aeronautical Engineering
Hyderabad, India
rishisokki2@gmail.com

Abstract

The emergence of user-generated image data on the internet has led to the creation of large datasets that often contain low-quality, irrelevant, or noisy images, thus adversely affecting the performance of deep learning models in computer vision applications. Although modern deep learning models are able to achieve high accuracy on curated benchmark datasets, they tend to overlook the quality of the input data. To overcome this shortcoming, this research work proposes ImageDC, a hybrid image data cleaning framework that aims to improve the quality of the dataset before the training of deep learning models. ImageDC proposes the use of rule-based image quality assessment methods and a fine-tuned ResNet50 convolutional neural network to classify and filter images into five categories: Clean, Blurry, Noisy, Low Contrast, and Blank. Additionally, the framework incorporates minority class filtering and low recognition rate filtering to filter out minority classes and misclassified images. The experimental outcome shows that the proposed hybrid framework outperforms rule-based and deep learning models in terms of classification accuracy and dataset quality.

Keywords—Data Cleaning; Deep Learning; Image Classification

ISBN: 978-81-996153-6-6

STEMEM -2026_A17

SURROGACY REGULATION IN INDIA

Sobhana Verma

Research Scholar ,School of Law

Sangam University, Bhilwara

Dr. Vishwa Deepak Bhatnagar

, Emeritus Professor,

SOLS, Sangam University, Bhilwara, India

dheerajjain.itm@gmail.com

Abstract

Abstract - This research paper examines the complex regulatory environment surrounding surrogacy in India, investigating its historical development and the intricate interplay of legal, ethical, and cultural factors. The paper examines the regulatory reforms that ensued after India became a prominent international hub for commercial surrogacy, with a specific emphasis on the intricate provisions of the Surrogacy (Regulation) Act, 2021. It emphasizes the impact of the act and addresses any limitations that were previously present. This study investigates the constitutional and legal ramifications that arise from the criteria for eligibility, with a particular focus on the effects on the infant, surrogate mothers, and intended parents. With the assistance of a global comparative analysis, this paper provides a nuanced perspective on surrogacy laws in Ukraine, the United States, and the United Kingdom, among others. These three jurisdictions were selected due to the fact that their surrogacy legislations regulate the industry to varying degrees: Ukraine regulates commercial surrogacy, the United States has state-made legislation, and the United Kingdom's legislation is very similar to that of India. The core of the manuscript consists of ten recommendations that are specifically designed for the Indian context. These recommendations promote the following: comprehensive legislation, parental rights recognition, autonomy for surrogate mothers, and ethical guidelines. The aforementioned suggestions encompass public education initiatives, anti-discrimination protocols, and international surrogacy regulations. In conclusion, the paper proposes a legal structure that is congruent with the cultural heterogeneity of India, thereby cultivating an atmosphere for surrogacy arrangements that is ethical, inclusive, and transparent.

Keywords - Surrogacy Regulation, India, Global Perspectives, Analysis.

ISBN: 978-81-996153-6-6
STEMEM -2026_A18

Phytochemical Screening, *In Vitro* Antioxidant and Anti-inflammatory Efficacy of *Anisomeles indica* (L.) Kuntze

Anu C Benny[1]* and Sheeja T Tharakan [1,2]

[1] Sree Narayana College, Nattika (Affiliated to University of Calicut), Kerala, India - 680566

[2] Vimala College (Autonomous), Thrissur (Affiliated to University of Calicut), Kerala, India -680009

anucbenny99@gmail.com

Abstract

Traditional treatments frequently utilize A. indica to treat immune system deficits, gastrointestinal dysfunction, and inflammatory illnesses. The plant, which is mostly collected from the wild and grown as a decorative as well as the oil that it contains in its leaves, is used extensively as a therapeutic herb. The present study examining the phytoconstituents and in-vitro antioxidant and anti-inflammatory qualities of plant extracts prepared in three different solvents. To find important phytoconstituents, freshly made plant extracts were put through both quantitative and qualitative phytochemical screening procedures. Antioxidant activity analyzed using DPPH radical scavenging assay and protein denaturation assay to assess anti-inflammatory qualities in various extracts. Numerous phytochemicals, including alkaloids, steroids, tannins, flavonoids, phenols, glycosides, and terpenoids, are present in the various extracts of A. indica. The largest quantity of phenol is found in A. indica aqueous extracts, while the highest concentration of flavonoids is found in ethanol extracts. Ethanol extracts of A. indica exhibit significantly greater antioxidant activity in vitro than other extracts. When compared to ethanol and petroleum ether extracts, the aqueous extract exhibited the most anti-inflammatory properties. Nevertheless, the presence of several phytochemicals gave all plant extracts strong anti-inflammatory and antioxidant properties. The latest study makes it easier for researchers to find and separate novel bioactive substances with potential medical uses as well as how they will likely act against different biological processes.

Key words: Phytochemical Screening, Antioxidant activity, anti-inflammatory properties bioactive substances,

ISBN: 978-81-996153-6-6

STEMEM -2026_A19

Comparative Analysis of Phytochemical Composition in Leaf and Bark Extracts of Poeciloneuron indicum Bedd.

Anjana Unni1, Sheeja T Tharakan1, 2

1 PG & Research Department of Botany, Sree Narayana College, Nattika, (University of Calicut), Thrissur, Kerala, 680566, India.

2 Department of Botany, Vimala College (Autonomous), (University of Calicut), Thrissur, Kerala 680009, India.

unnianjana7@gmail.com

Abstract

Secondary metabolites play a crucial role in plant survival and adaptation by providing chemical defence against herbivores, pathogens, and environmental stress, while also contributing significantly to the medicinal, pharmaceutical, and ecological value of plants. *Poeciloneuron indicum Bedd.*, an endemic tree species sparsely distributed in the Western Ghats and belonging to the family *Clusiaceae*, has received limited scientific attention regarding its phytochemical and bioactive potential despite reports of its traditional medicinal uses. The present study aimed to evaluate location and solvent dependent variations in the phytochemical profile of *P. indicum* through qualitative and quantitative analysis of major secondary metabolites in the leaf and bark. Qualitative phytochemical screening revealed a uniform profile with the consistent presence of alkaloids, phenols, flavonoids, diterpenoids, triterpenoids, glycosides, tannins, saponins, and coumarins. Quantitative analysis indicated that total flavonoid content ranged from **0.06 ± 0.03 to 7.53 ± 0.03 mg QE/g extract** in Location 1 and **0.16 ± 0.02 to 12.80 ± 0.05 mg QE/g extract** in Location 2. Similarly, total phenolic content varied between **1.89 ± 0.04 and 19.49 ± 0.09 mg GAE/g extract** in Location 1 and **0.86 ± 0.01 to 18.96 ± 0.09 mg GAE/g extract** in Location 2. Solvent-dependent analysis demonstrated that methanolic extracts of both leaf and bark from both locations exhibited the highest phenolic and flavonoid contents. Only minor variations were observed in the levels of these metabolites between the locations. The presence of such diverse secondary metabolites highlights the phytochemical richness of *P. indicum* and supports its potential for further pharmacological investigation. The relatively uniform phytochemical composition across locations suggests chemotypic stability, indicating the feasibility of wider cultivation without significant loss of therapeutic quality and ensuring consistent raw-material supply for pharmaceutical applications.

Keywords: Secondary metabolites, Leaf, Bark, Total Phenol Content, Total Flavonoid Content.

ISBN: 978-81-996153-6-6

STEMEM -2026_A20

Preliminary Qualitative and Quantitative Phytochemical Analysis of Gynochthodes umbellata (L.) Razafim. & B. Bremer

Sarika S Nair1, Sheeja T Tharakan1,2*

1 PG & Research Department of Botany, Sree Narayana College, Nattika (University of Calicut), Thrissur, Kerala, 680566, India

2 Department of Botany, Vimala College (Autonomous), (University of Calicut), Thrissur, Kerala, 680009, India

sarikasnair1996@gmail.com

Abstract

Medicinal plants have been used in the treatment of various diseases as they possess potential pharmacological activities including antimicrobial, antioxidant, anti-inflammatory, analgesics, anti-diabetic, anti-hypertensive, antidiarrheal and other activities. Phytoconstituents individually or in the combination, determine the therapeutic value of a medicinal plant. Alkaloids, flavonoids, phenolics, tannins, saponins, steroids, glycosides, terpenes etc. are some of the important phytochemicals with diverse biological activities. The pharmacological activity of a plant can be predicted by the identification of the phytochemicals. Currently, phytochemicals are determined by various modern techniques, but the conventional qualitative tests are still popular for the preliminary phytochemical screening of plants. Gynochthodes umbellata is a rare traditional medicinal plant from the Rubiaceae family. Though this plant is well-known for its medicinal properties, little scientific studies have been conducted thus far. The present study aimed to perform a preliminary qualitative and quantitative phytochemical screening of G. umbellata to identify the major classes of bioactive constituents responsible for its pharmacological effects. Fresh plant material was collected, authenticated, air-dried, and extracted sequentially with petroleum ether, ethanol, and distilled water. Standard qualitative tests revealed that ethanolic and aqueous extracts were rich in flavonoids, tannins, phenols, glycosides, coumarins, and saponins, while the non-polar extract contained terpenoids. The total phenolic and flavonoid content is determined by spectrophotometric method. The amount of total phenolic in extracts was determined in comparison with gallic acid, whereas total flavonoid was estimated corresponding to quercetin. Among the different extracts, the ethanolic extract exhibited the highest phenolic and flavonoid content with mean value 8.89±0.15 mg GAE/g extract and 17.31±0.04 mg QE/g extract respectively. These results highlight the diverse phytochemical composition of G. umbellata and suggest its potential therapeutic significance, supporting its traditional medicinal applications.

ISBN: 978-81-996153-6-6

STEMEM -2026_A21

Image based authentication using zero knowledge protocol with multi factor authentication

David Raj. G (assistant professor)

davidrajengg@gmail.com

Mohammed Ishaqe Ali. A

mohammedishaqeali10@gmail.com

Mohamed Kaif. A

Kaif.mddon@gmail.com

Abstract

Image-based authentication systems utilize the strong visual memory of users as an alternative to traditional text-based passwords. Human users often remember images and visual patterns more easily than complex textual passwords, making graphical authentication systems both user-friendly and memorable. However, many existing image-based authentication methods rely on direct image matching or stored graphical patterns on servers. Such approaches introduce significant security and privacy concerns, as they are vulnerable to phishing attacks, shoulder surfing, replay attacks, and database breaches. Additionally, storing image data or graphical patterns directly in authentication servers can lead to serious privacy risks if the database is compromised. To address these challenges, this work proposes an enhanced authentication framework that integrates image-based graphical authentication with Zero Knowledge Protocol (ZKP) concepts and modern cryptographic security techniques. In the proposed system, users authenticate by selecting a sequence of grid positions on an image structured as a 5×5 grid. Instead of storing the actual graphical pattern, the selected grid sequence is transformed into a secure cryptographic representation using the SHA-256 hashing algorithm combined with a randomly generated unique salt for each user. The use of salted hashing ensures that even if multiple users select identical graphical patterns, the stored authentication values remain different, thereby improving resistance against brute-force attacks, dictionary attacks, and rainbow table attacks. To further enhance the security level of the system, passkey-based authentication based on public-key cryptography is incorporated.

During the login process, the server generates a random challenge which is signed by the user's device using a securely stored private key. The server verifies the signed response using the corresponding public key stored in the system database. This challenge–response mechanism ensures that sensitive authentication data is never transmitted directly, preventing replay attacks and impersonation attempts. By integrating graphical password techniques, salted cryptographic hashing, passkey authentication, and Zero Knowledge Protocol principles, the proposed system creates a multi-layer authentication model that improves both security and usability. The experimental results demonstrate that the system provides strong privacy protection, high authentication accuracy, and improved resistance against common security threats, making it suitable for real-world secure authentication applications.

Keywords: Image-Based Authentication, Zero Knowledge Protocol, Graphical Password, Salted Hashing, Passkey Authentication

ISBN: 978-81-996153-6-6

STEMEM -2026_A22

Formulation of Herbal Tea and Its Antioxidant Potential

Sheeja T Tharakan 1, 2*

1 Vimala College (Autonomous), Thrissur (Affiliated to University of Calicut), Kerala, India - 680009

2 Sree Narayana College, Nattika (Affiliated to University of Calicut), Kerala, India -680566

sheejattharakan@vimalacollege.edu.in

Abstract

Tea is a culturally significant beverage and has a history deeply rooted in human civilization. The focus of this study was to screen the major phytochemical constituents, determine the TPC(total phenol content), TTC(total tannin content), as well as the antioxidant activity of herbal tea using *Mentha piperita*, *Coleus amboinicus, Ocimum tenuiflorum*, *Psidium gujava*, and *Morus alba*, and the preparation of polyherbal tea bags. Using the powder of these herbal plants, polyherbal tea bag was prepared. Numerous secondary metabolites, including tannin, phenol, saponin, glycoside, flavonoid, terpenoid, steroid, and alkaloid, were found in the initial phytochemical screening. Using the Folin-Ciocalteu reagent assay, total phenol and tannin content have been determined. Compared to polyherbal formulation, *M. alba* extract showed a significant amount of TPC (11µg/GAE). TTC was higher in *M. piperita*, *O. tenuiflorum*, *P. guajava*, *M. alba* (67µg/TAE, 53µg/TAE, 53µg/TAE, 50µg/TAE) extracts compared to the polyherbal formulation. The TPC and TTC results are compared with *C. sinensis* extract. The DPPH radical scavenging test measured antioxidant activity *in vitro*. Extract of plant and polyherbal formulation showed a significant amount of percentage of inhibition. The study concludes that the herbal formulation has remarkable therapeutic advantages. And also, more research is necessary to investigate different cultural practices on the efficiency of this polyherbal formulation.

Key words: Herbal Tea, human civilization, DPPH, Numerous secondary metabolites, therapeutic advantages.

ISBN: 978-81-996153-6-6
STEMEM -2026_A23

Spectral Discrimination And Separable Analysis of Crops And Weeds Using Deep learning techniques

Dr. M. Purushottam Reddy
Professor
Institute of Aeronautical Engineering
purushotham.MTS@gmail.com
Chadive Tejawsini Reddy
Institute Of Aeronautical Engineering
reddytejaswini42@gmail.com
Edulukanti Vinay Kumar
Institute Of Aeronautical Engineering
vinaye8919@gmail.com
Jatothu Sindhu Rathod
Institute Of Aeronautical Engineering sindhurathod074@gmail.com

Abstract

Weeds are a big problem for farming because they compete with crops for water, nutrients, and sunlight, which lowers yields. Using herbicides and manually pulling weeds are two common ways to control weeds, but they are expensive, time-consuming, and bad for the environment. This research introduces an automated system for crop and weed detection, developed using the YOLOv3 deep learning framework.

The model was trained on a set of 1,300 labeled agricultural images that showed sesame crops and different types of weeds. The system uses YOLOv3 and OpenCV to find crops and weeds in real time, making bounding boxes and confidence scores for each class. Using confidence thresholds and non-maximum suppression in post-processing makes sure that predictions are strong.

The system is available on a number of platforms to make it easier to use. These include a command-line tool, a Flask-based web app with interactive features, a demo app for people who aren't tech-savvy, and an OpenCV Jupyter notebook for research and teaching. This ecosystem works on many platforms and helps farmers, researchers, and teachers. It encourages sustainable precision agriculture.

Key words: Spectral Discrimination, OpenCV Jupyter notebook, 1,300 labeled agricultural images, OpenCV, interactive features

ISBN: 978-81-996153-6-6
STEMEM -2026_A24

A Review on the Application of Deep Learning Techniques in the Detection of Diabetic Retinopathy

Anil Kumar*, Mridul Chawla
21001903001anil@dcrustm.org*, mridulchawla.ece@dcrustm.org
Department of Electronics and Communication Engineering, DCRUST, Murthal, 131039, Sonipat, Haryana, India
21001903001anil@dcrustm.org

Abstract

Diabetic retinopathy (DR) is a major contributor to loss of vision and blindness of adults in their working-age globally. One of the most effective ways to prevent DR is through early detection and an accurate grading system. Traditionally, DR screening has been largely dependent on manual checking by ophthalmologists, which is slow, subjective, and requires a lot of resources. Recently, deep learning (DL), especially convolutional neural networks (CNNs), has achieved great success in the automatic detection and severity classification of DR from the retinal fundus images. This review paper is mainly focused on presenting a comprehensive survey of the previous works on DR detection using DL methods, describing different DL models, publicly available datasets, evaluation criteria, and challenges in the DR detection field. In addition, the paper presents the recent developments like attention mechanisms, hybrid models, multitask learning, and uncertainty-aware approaches. This review serves as a guide to the existing limitations and possible forthcoming research activities in this field for achieving accurate and efficient DR screening systems.

Keywords: Clinical, diabetes, blood vessels, fundus imaging, medical image analysis

ISBN: 978-81-996153-6-6

STEMEM -2026_A25

Artificial Intelligence in Law Enforcement: Balancing Public Security and Human Rights in India.

akshayarajan742000@gmail.com

SUBMITTED BY

AUTHOR

KISHORE CHANDURU K.R

RESEARCH SCHOLAR

VISTAS

CHENNAI

CO AUTHOR

Dr. ASHWATHI SUKUMARAN

ASSISTANT PROFESSOR & RESEARCH SUPERVISOR

VISTAS

CHENNAI

Introduction

Abstract

The rapid advancement of Artificial Intelligence (AI) has significantly transformed many sectors, including law enforcement. AI technologies such as facial recognition systems, predictive policing, biometric identification, and data analytics are increasingly used by law enforcement agencies to prevent crime, identify suspects, and improve public security. These technological tools enable authorities to analyse large volumes of data efficiently and respond more effectively to potential threats. In a country like India, where population size and crime complexity present significant challenges to policing, AI-based technologies offer promising solutions to strengthen law enforcement mechanisms. However, the growing reliance on AI in policing also raises serious concerns regarding the protection of fundamental human rights. The extensive use of surveillance technologies and automated decision-making systems may interfere with individual privacy, freedom, and equality. The right to privacy has been recognized as a fundamental right under the Justice K. S. Puttaswamy (Retd.) v. Union of India, which emphasizes the need to protect personal liberty in the digital age. Additionally, the constitutional guarantees under the Constitution of India require that any use of technology by the state must respect fundamental rights and follow principles of fairness and proportionality.

Key words: biometric identification, technological tools, AI-based technologies, fundamental rights.

ISBN: 978-81-996153-6-6

STEMEM -2026_A26

A STUDY ON CYBERSECURITY LAWS AND BUSINESS LIABILITY IN INDIA

SUBMITTED BY

akshayarajan742000@gmail.com

GODHAWARI.P

ASSISTANT PROFESSOR

VISTAS

CHENNAI

Abstract

Cybersecurity has become a major worry for governments, corporations, and individuals alike in the current digital era. Organizations are more susceptible to financial fraud, ransomware assaults, and data breaches as cyber threats get more complex. Strong cybersecurity legislation are necessary for both business protection and customer trust in India, as the country's growing embrace of digital technologies, e-commerce, and cloud computing has greatly raised the risk of cybercrimes. The Information Technology Act, 2000 (IT Act), which contains rules pertaining to cyber crimes, data protection, and electronic governance, is the main piece of legislation controlling cybersecurity in India. To further guarantee cybersecurity resilience, regulatory organizations including the Securities and Exchange Board of India (SEBI), the Reserve Bank of India (RBI), and the Indian Computer Emergency Response Team (CERT-In) have released sector-specific guidelines. However, with the passage of the Digital Personal Data Protection (DPDP) Bill, 2023, which seeks to improve data privacy and put more stringent obligations on companies that handle personal data, the legal environment is still changing. Companies now risk financial penalties, harm to their brand, and litigation as a result of cybersecurity breaches. It is expected of organizations to put in place appropriate security procedures to safeguard user information and stop cyberattacks.

Key words: Cybersecurity, resilience, cyberattacks, electronic governance, the Indian Computer Emergency, Reserve Bank of India (RBI),

ISBN: 978-81-996153-6-6

STEMEM -2026_A27

A STUDY ON THE PROPERTY DISPUTES AND THE ROLE OF ALTERNATIVE DISPUTE RESOLUTION (ADR) MECHANISMS

SUBMITTED BY

akshayarajan742000@gmail.com

NAKSHATHRA K.K

ASSISTANT PROFESSOR

VISTAS

CHENNAI

Abstract

Among the most common legal conflicts in the world are property disputes, which can result from problems like adverse possession, landlord-tenant disputes, boundary disputes, and inheritance claims. These disagreements are a major issue for people, companies, and governments since they frequently result in drawn-out legal proceedings, financial hardship, and social unrest. Although necessary for protecting legal rights, the traditional court system is frequently overworked with a large number of property-related disputes, which leads to adversarial processes, high expenses, and delays. Alternative Dispute Resolution (ADR) procedures have become a successful substitute for litigation in order to address these issues. Property disputes can be resolved more quickly, cheaply, and amicably with the help of alternative dispute resolution (ADR) techniques such mediation, arbitration, negotiation, and conciliation. ADR is currently being actively promoted as the preferred method of dispute resolution in many countries across the world in an effort to lighten the load on the courts and promote cooperative solutions. The purpose of this study is to examine the different facets of property conflicts and how alternative dispute resolution (ADR) might help resolve them. It looks at the typical reasons for property disputes, assesses how well various ADR mechanisms work, reviews judicial viewpoints and case law, pinpoints obstacles in ADR procedures, and suggests policy changes to improve ADR in property dispute settlement.

key words: legal rights**,** promote cooperative solutions, landlord-tenant disputes, address these issues.

ISBN: 978-81-996153-6-6

STEMEM -2026_A28

A STUDY ON THE ROLE OF LETTERS OF CREDIT IN INTERNATIONAL TRADE LAW

akshayarajan742000@gmail.com

SUBMITTED BY

AKSHAYA R

ASSISTANT PROFESSOR

VISTAS

CHENNAI

Abstract

Due to its ability to facilitate cross-border exchanges of goods and services, international trade is essential to the expansion of the world economy. Cross-border transactions do, however, carry a number of risks, such as fraud, nonpayment, and legal ambiguities brought on by disparities in national laws. Businesses use Letters of Credit (LCs), a popular trade finance tool that guarantees safe payments and seamless international transaction execution, to reduce these risks. A Letter of Credit is a legally enforceable contract that a bank issues on behalf of an importer and that, provided certain documentation conditions are met, guarantees payment to the exporter. Buyers are guaranteed that goods will be transported in accordance with the terms of the contract, and sellers are guaranteed payment thanks to this system. The International Chamber of Commerce (ICC) created the Uniform Customs and Practice for Documentary Credits (UCP 600), which is the main piece of legislation regulating LCs and guaranteeing consistency in their use around the globe. LCs face a number of operational and legal obstacles in spite of their significance in international trade. Although the autonomy concept guarantees that LCs operate separately from the underlying contract, fraud, errors in documentation, and jurisdictional disputes frequently put this principle to the test. Furthermore, the rise of blockchain-based smart contracts and electronic LCs (eUCP) as a result of trade finance's growing digitization raises concerns regarding legal recognition and enforcement across different jurisdictions. The legal underpinnings, difficulties, and changing function of LCs in international trade law are examined in this study.

Key words: Trade Law, Guarantees Payment, Lcs Operate Separately, Documentary Credits (UCP 600), Electronic Lcs (Eucp), Legal Underpinnings

ISBN: 978-81-996153-6-6

STEMEM -2026_A29

A STUDY ON
TRANSFORMATION FROM E-COMMERCE TO Q-COMMERCE

Dr. Rashi Malik

ASSOCIATE PROFESSOR

Faculty of Commerce and Management,

SRM University, Delhi-NCR, Sonipat, Haryana

The retail industry has experienced a rapid digital transformation, evolving from traditional store-based shopping to e-commerce and now to quick commerce (Q-commerce), where products are delivered within minutes. This shift reflects changing consumer expectations, particularly the growing importance of speed, convenience, and immediacy in everyday purchases. The present study investigates the transition from e-commerce to Q-commerce in the Indian context by examining consumer preferences, behavioral patterns, and demographic influences affecting platform usage. The research follows a descriptive quantitative design based on primary data collected through a structured questionnaire distributed via Google Forms. A total of 105 respondents familiar with both e-commerce and Q-commerce platforms participated in the survey using convenience sampling. Reliability of the instrument was tested using Cronbach's Alpha (0.922), indicating high internal consistency. Statistical analysis was conducted using Independent Samples t-test and One-Way ANOVA to determine significant differences across demographic variables such as age, gender, and employment status. The findings reveal that the main drivers of Q-commerce adoption are faster delivery and the convenience of fulfilling immediate needs, with groceries and daily essentials being the most frequently ordered products. The results also show statistically significant variations in platform preference across demographic groups. Despite increasing popularity, certain limitations persist: high delivery charges and limited discounts were identified as the major barriers to frequent usage. While a majority of respondents consider Q-commerce sustainable in the long term, many consumers continue to rely on both models simultaneously, using Q-commerce for urgent purchases and traditional e-commerce for planned and variety-based shopping. The study concludes that Q-commerce isn't replacing e-commerce but functioning as a complementary retail channel shaped by urgency-based consumption. For sustainable growth, platforms must focus on affordability, wider product assortment, and consistent delivery reliability. The research contributes to understanding evolving consumer behavior in hyperlocal delivery ecosystems and offers practical insights for businesses and marketers developing strategies in the emerging instant-delivery economy.

Keywords: Quick Commerce, E-commerce, Consumer Behavior, Instant Delivery, Digital Retail, Hyperlocal Logistics

ISBN: 978-81-996153-6-6

STEMEM -2026_A30

Development of Maintenance Standard Operating procedure for Transformer Manufacturing Industry

***Jyot Nitinbhai Suthar1,Gajanan Shankarrao Patange2**

Department of Mechanical Engineering, CSPIT, CHARUSAT, Changa, Gujarat, India – 388421

***Corresponding author E-mail: - 24pgamt005@charusat.edu.in**

Abstract

The global industrial ecosystem relies significantly on the uninterrupted transmission and distribution of electrical power, where the reliability and structural integrity of power transformers are of paramount importance. Transformer manufacturing industries operate under stringent demands to achieve high production efficiency and zero-defect output. However, inadequate maintenance practices often result in equipment failures, production disruptions, and compromised product quality.This paper presents a comprehensive review and synthesis of maintenance strategies for transformer manufacturing systems, with a focus on developing a structured and effective Standard Operating Procedure (SOP) framework. It integrates key concepts from reliability engineering, Total Productive Maintenance (TPM), and emerging Industry 4.0 technologies to establish a systematic and data-driven maintenance approach. Various maintenance methodologies, including preventive, predictive, and corrective maintenance, are critically analyzed alongside modern industrial tools such as Lean practices, 5S, and Root Cause Analysis (RCA).The study highlights that the implementation of a well-defined and digitized SOP significantly enhances equipment availability, reduces downtime, improves productivity, and ensures operational safety. Furthermore, it emphasizes the role of empirical data and performance metrics in enabling continuous improvement and informed decision-making.Based on the findings, a conceptual framework is proposed for the development and implementation of a maintenance SOP tailored specifically to transformer manufacturing industries, aiming to achieve higher reliability, efficiency, and long-term sustainability.

Keywords:-

Transformer manufacturing, Maintenance SOP, Industry 4.0, Total Productive Maintenance, Predictive Maintenance

ISBN: 978-81-996153-6-6

STEMEM -2026_A31

Implementation And Validation of Critical UAV Components to Improve Multirotor Drone Performance

Kashyap Rameshlal Solanki[1], Gajanan Shankarrao Patange2 Department of Mechanical Engineering, CSPIT, CHARUSAT, Changa, Gujarat, India – 388421

*Corresponding author E-mail: - 24pgamt006@charusat.edu.in

Abstract

Multirotor unmanned aerial vehicles (UAVs) are widely used in applications such as surveillance, inspection, mapping, and payload transportation. The performance of these systems is highly dependent on the proper selection and integration of key components such as motors, electronic speed controllers (ESCs), batteries, and frame configurations. In many practical drone systems, these components are selected without analysing their combined effect on system performance, which often leads to reduced efficiency, lower flight endurance, and unstable operation.

This paper presents an experimental validation of critical UAV components to improve multirotor drone performance. The study focuses on motor selection based on thrust-to-weight ratio, esc selection based on current handling capability, and battery selection based on energy density and operating conditions. A 6s-compatible propulsion system is implemented to improve system efficiency and scalability.

Experimental analysis is conducted on a quadcopter platform with an all-up weight of approximately 3 kg using a 13000 Mah lithium-ion battery. The results show a significant improvement in flight endurance, achieving up to 43 minutes of flight time. The study also highlights improved performance under low-temperature conditions and demonstrates that proper component selection can significantly enhance UAV efficiency, reliability, and operational flexibility.

Keywords:

Multirotor UAV, drone performance, motor selection, esc, lithium-ion battery, UAV propulsion system

ISBN: 978-81-996153-6-6

STEMEM -2026_A32

Real-Time EEG Noise Reduction Using Hybrid Wavelet–Autoencoder Model

Dr.Anitha G, Afzhal ahmand, Mohamed Musthaq H, Sudhakar B, Syed Sameer A
Department of Electronics And Instrumentation Engineering
B S Abdur Rahman Crescent Institute of Science and Technology
anidhag@crescent.education, *s7200040486@gmail.com*

Abstract - Electroencephalogram (EEG) signals are widely used to monitor activity in the brain for clinical diagnosis, brain–computer interface (BCI) systems, cognitive state analysis, and for neurofeedback applications. Yet EEG signals are highly sensitive to several noise and artifacts including ocular artifacts (EOG), muscle activity (EMG), power line interference, and motion artifacts, which negatively affect the signal quality and also diminish the accuracy of downstream analysis.

Keywords — EEG, Noise Reduction, Wavelet Transform, Autoencoder, Deep Learning, Signal Processing, Brain–Computer Interface

ISBN: 978-81-996153-6-6

STEMEM -2026_A33

Respiratory Health Monitoring System with Graphical Visualization Using Machine Learning

Dr. H. Kareemullah, Prithvka V, Rida Feroz, Shanmuga Priya S

Department of Electronics and Instrumentation Engineering

B.S. Abdur Rahman Crescent Institute of Science and Technology, Chennai, India

kareemullah@crescent.education, prithvka@gmail.com

Abstract

Lung diseases like asthma, COPD, and various restrictive conditions don't announce themselves with obvious warning signs — which is exactly why catching them early matters so much. The problem is that reading a spirometry test accurately still depends almost entirely on having a trained specialist in the room, and that's not a luxury every clinic or hospital can afford. When specialist availability is limited, diagnoses get delayed, inconsistent, or missed altogether. This paper presents a machine learning-driven Respiratory Health Monitoring System that automates the classification of five clinically significant lung patterns — Normal, Obstructive, Restrictive, Mixed, and PRISm (Preserved Ratio Impaired Spirometry) — using spirometry parameters derived from the NHANES dataset. The system employs five supervised learning algorithms, with Extra Trees achieving the highest classification accuracy of 98.85%. A patient-facing graphical interface built using Python and Tkinter enables real-time prediction, clinical notation, flow-volume loop visualization, and patient record management. The proposed system bridges the diagnostic gap by delivering consistent, interpretable, and accessible respiratory health analysis.

Keywords: Spirometry, Lung Pattern Classification, Extra Trees, Machine Learning, PRISm, Flow-Volume Loop, Respiratory Health, NHANES

ISBN: 978-81-996153-6-6

STEMEM -2026_A34

IMPLEMENTATION OF 8D IN INVESTMENT CASTING

Vishnu Kamlesh Bhalara[1], Gajanan Shankarrao Patange[2]

Department of Mechanical Engineering, CSPIT, CHARUSAT, Changa, Gujarat, India – 388421

E-mail: - vishnubhalara1330@gmail.com

24pgamt001@charusat.edu.in

I. ABSTRACT

This report presents a comprehensive study on the implementation of the 8D (Eight Disciplines) problem-solving methodology to address high rejection rates in an investment casting process. The study focused on valve body and impeller components, which suffered from a high initial total rejection rate of 7.04%. By forming a cross-functional team and employing systematic root cause analysis, the primary defects—Wax Non-fill, Pinhole, and Bulge—were identified and resolved. After implementing permanent corrective actions, the rejection rate successfully dropped to an average of 1.43% over a three-month post-implementation period.

Keywords: 8D Methodology, Investment Casting, Ishikawa Diagram, Pareto Analysis, Why Why analysis.

ISBN: 978-81-996153-6-6

STEMEM -2026_A35

Defects Analysis and Its Reduction Using Quality Control Tools in Gear Manufacturing

Harmish Bhatt[1], Gajanan Patange[2]

1,2 Department of Mechanical engineering, CSPIT, CHARUSAT University, Changa, Anand, Gujarat, India.

Corresponding author E-mail: - harmishbhatt.me@charusat.ac.in

harmishbhatt.me@charusat.ac.in

Abstract

The efficient management of quality control processes is imperative for organizations operating in competitive industrial sectors. This paper focuses on the application of Quality Control (QC) tools to address gear defects within ABC Pvt. Ltd, a leading manufacturer in the power transmission sector. The objective of this paper is to systematically collect, analyze, and reduce gear defects through the implementation of QC methodologies. The paper begins with a comprehensive review of existing literature on quality control principles, QC tools, and their relevance in industrial settings. Subsequently, a detailed analysis of gear defects within industry is conducted, identifying common types of defects and their underlying causes. Utilizing a range of QC tools such as Check sheet, Pareto analysis, Ishikawa diagrams, control charts, and histograms, data on gear defects is systematically collected and analyzed. This enables the identification of critical areas for improvement and the formulation of targeted strategies to reduce defects and enhance overall product quality. The paper concludes with a comprehensive evaluation of the outcomes achieved, highlighting the impact of QC tools in mitigating gear defects and improving manufacturing processes. The findings of this study contribute valuable insights to the field of quality control, demonstrating the efficacy of QC tools in addressing specific manufacturing challenges. Furthermore, the project underscores the importance of continuous improvement and proactive quality control measures in enhancing organizational performance and maintaining competitive advantage in the industry.

Keywords: - Gear defects, Quality control tools, Gear manufacturing.

ISBN: 978-81-996153-6-6

STEMEM- 2026_A36

Brain Connectivity and Asymmetric Analysis using EEG and Graph Neural Network

Dr. G. Anitha, Mohamed Safin A, Mohamed Injamaam M, Rafiudeen J, Noorul Hasan J

Department Of Electronics And Instrumentation Engineering

B.S. Abdur Rahman Crescent Institute of Science and Technology

Chennai, India

anidhag@crescent.education, injamaam128@gmail.com, msafin268@gmail.com

Abstract

Abstract - EEG is mainly used for analyzing brain activity in neuroscience and brain–computer interface applications. Traditional EEG methods primarily rely on single channel features and usually do not take in the interactions between various brain regions. We propose a framework for brain connections and asymmetry analysis by Graph Neural Networks (GNN). EEG signals from 4 channels (O1, O2, T3, T4) are preprocessed and spectral band power, hemispheric asymmetry, and functional connectivity characteristics are extracted. The features are depicted as a graph with EEG channels as nodes and connectivity values taking up edges. A GNN model is then used to learn spatial relationships between brain regions and classify states of relaxation, alertness, drowsy, and the like. Experimental findings showed that the graph based approach is superior to the state classifiers based on traditional machine learning methods.

Keywords — EEG, Brain Connectivity, Asymmetry Analysis, Graph Neural Network, Brain State Classification

ISBN: 978-81-996153-6-6

STEMEM -2026_A37

TONGUE IMAGE ENHANCEMENT FOR AYURVEDIC DIAGNOSIS

Vinesh Gone1, Harshini Reddy Devasani2 ,Meenakshi Mekala3and Poojitha Kurma4

Institution:Institute Of Aeronautical Engineering/Information Technology, Dundigal, India

Abstract

Ayurveda thinks that looking at the tongue is an important way to figure out what is going on inside the body and to see if the doshas like Vata, Pitta and Kapha are out of balance. The problem is that the traditional way of looking at tongues to diagnose problems is done by people so it is not always accurate and can be wrong. This study is trying to create a system that can automatically make tongue images clearer and classify them using a kind of computer program that combines Convolutional Neural Network and Support Vector Machine models. Ayurveda and the doshas, like Vata, Pitta and Kapha can really benefit from this system. The proposed method enhances tongue images through preprocessing techniques such as noise removal, contrast enhancement, and segmentation, followed by feature extraction using CNN. The extracted deep features are classified using SVM to improve diagnostic accuracy. Experimental results demonstrate that the CNN–SVM hybrid model achieves superior performance compared to standalone classifiers, with an accuracy of up to 93%. The system provides a reliable, objective, and efficient approach to assist Ayurvedic practitioners in diagnosis

Key word :pitta and kapha,Neural network,diagnosis, tongue images, Support Vector Machine models

ISBN: 978-81-996153-6-6

STEMEM-2026_A38

Transforming Smallholder Agriculture through Collective Action: A Comprehensive Review on the Functional and Financial Performance of Farmer Producer Organizations (FPOs) in Tamil Nadu, India

1 Dr.C.Mabel Joshaline, 2 Dr.M.Pandeeswari

1 Assistant Professor, Department of Rural Development Science,
Arul Anandar College, Madurai.

2 Assistant Professor & Head, Department of Rural Development Science
Arul Anandar College, Madurai.

Abstract:

Farmer Producer Organizations (FPOs) have emerged as a pivotal institutional innovation to empower smallholder farmers in India, offering an inclusive platform to enhance productivity, market access, and bargaining power. This review synthesizes recent research on the functional and financial performance of FPOs in Tamil Nadu, including women-led FPOs and those focusing on millets and oilseeds. Women FPOs are the main contenders of the majority of schemes of Central and State Agriculture Departments. Government departments orient the FPOs to monitor their accounts periodically and submit their annual records for accounts auditing and insist upgradation of their performance indicators. Drawing on primary data, ratio analysis, standardized scoring models, and policy reviews, the study identifies critical success factors, performance challenges, and enabling conditions. The review also highlights gender dynamics, institutional frameworks, and regional growth trends, providing policy recommendations for sustainable FPO development.

Keywords: Transforming- Agriculture- Farmer Producer Organization- Financial performance

ISBN: 978-81-996153-6-6

STEMEM -2026_A39

EfficientNetB0-Based Deep Learning Framework for Robust Classification of Hop Plant -Diseases and Pest Infestations

SARVASUDDI KAVYANJALI

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mr. A. V. V. Chakraphani

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Abstract

Plant diseases and pest infestations significantly impact agricultural productivity and crop quality. This project presents a deep learning framework based on EfficientNetB0 for the robust classification of hop plant diseases and pest infestations.

The system utilizes high-resolution images of hop plants and applies preprocessing techniques such as normalization, resizing, and augmentation to enhance dataset quality. EfficientNetB0, known for its efficiency and accuracy, is employed to extract complex features and classify various disease and pest categories. Transfer learning is used to improve performance with limited datasets.

The proposed model achieves high classification accuracy and demonstrates strong generalization across different environmental conditions. It provides a valuable tool for farmers and agricultural experts, enabling early detection and effective management of plant diseases, thereby improving crop yield and sustainability.

II. Keywords

Plant Disease Detection, EfficientNetB0, Deep Learning, Agriculture AI, Image Classification, Pest Detection, Transfer Learning, Crop Monitoring

ISBN: 978-81-996153-6-6
STEMEM -2026_A40

Smart Water Purification Monitoring System

SHAIK KHADAR BABA
Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)
Ms. K. Lekhasree
Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

Access to clean and safe drinking water is essential for human health, yet water contamination remains a major global issue. This project presents a smart water purification monitoring system that utilizes IoT technology to ensure water quality and safety.

The system incorporates sensors to monitor parameters such as pH level, turbidity, temperature, and dissolved impurities in real time. The collected data is transmitted to a centralized system for analysis and monitoring. Alerts are generated when water quality deviates from safe standards, enabling timely intervention.

The proposed system enhances water quality management by providing continuous monitoring and automated alerts. It demonstrates the effectiveness of IoT in environmental monitoring and contributes to improving public health and safety.

II. Keywords

Water Quality Monitoring, IoT, Smart Systems, Sensors, pH Detection, Environmental Monitoring, Real-Time Data, Embedded Systems

ISBN: 978-81-996153-6-6

STEMEM -2026_A41

Voice-Controlled Virtual Assistant for Smart Homes

SHAIK NARAVADA KARISHMA

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Dr. Ch. Swapna Priya

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

The increasing adoption of smart home technologies has created a demand for intuitive and efficient control systems. This project presents a voice-controlled virtual assistant designed to automate and manage smart home devices using natural language commands. The system utilizes speech recognition and Natural Language Processing (NLP) techniques to interpret user inputs and execute commands such as controlling appliances, setting reminders, and managing daily tasks. Integration with IoT devices enables seamless automation and remote accessibility. Machine learning algorithms are used to improve system accuracy and adapt to user preferences over time.

The proposed assistant enhances user convenience, accessibility, and efficiency in managing smart environments. It demonstrates the integration of AI, IoT, and voice technologies in building intelligent home automation systems.

II. Keywords

Voice Assistant, Smart Home, Natural Language Processing, Speech Recognition, IoT, Home Automation, AI Systems, Human-Computer Interaction

ISBN: 978-81-996153-6-6

STEMEM -2026_A42

Customer Churn Analysis Using Python

AMMULOJU AMRUTHA

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Dr. B. Prasad

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

Customer churn is a critical challenge faced by businesses, particularly in highly competitive industries such as telecommunications, banking, and e-commerce. Retaining existing customers is often more cost-effective than acquiring new ones, making churn prediction an essential aspect of business strategy. This project presents a data-driven approach to analyze and predict customer churn using Python-based machine learning techniques.

The system utilizes historical customer data, including demographic details, usage patterns, and service interactions, to identify key factors influencing customer attrition. Data preprocessing techniques such as handling missing values, encoding categorical variables, and feature scaling are applied to improve model performance. Multiple machine learning algorithms, including Logistic Regression, Decision Trees, and Random Forest, are implemented and evaluated to determine the most effective model for churn prediction.

The proposed model provides accurate predictions and actionable insights, enabling organizations to identify high-risk customers and implement targeted retention strategies. Visualization techniques are also employed to present trends and patterns clearly. Overall, this project demonstrates the effectiveness of machine learning in enhancing customer retention and supporting data-driven decision-making in modern businesses.

II. Keywords

Customer Churn Analysis, Machine Learning, Python, Predictive Analytics, Data Preprocessing, Logistic Regression, Random Forest, Customer Retention, Data Visualization, Classification Models

ISBN: 978-81-996153-6-6

STEMEM -2026_A43

Smart Cloud Computing: Integrating AI and ML for Optimized Resource Allocation

A. LVS HARINI

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mrs. T. V. Lakshmi Devi K

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

Cloud computing has revolutionized the way organizations store, manage, and process data by providing scalable and on-demand computing resources. However, efficient resource allocation remains a significant challenge due to dynamic workloads, varying user demands, and cost constraints. This project presents a smart cloud computing framework that integrates Artificial Intelligence (AI) and Machine Learning (ML) techniques to optimize resource allocation in cloud environments.

The proposed system leverages predictive analytics to analyze historical workload data and forecast future resource requirements. Machine learning algorithms such as regression models and clustering techniques are employed to dynamically allocate computing resources, ensuring optimal utilization while minimizing operational costs. The framework also incorporates real-time monitoring to adapt to changing workloads and prevent issues such as over-provisioning and under-utilization.

By improving resource allocation efficiency, the system enhances performance, reduces latency, and ensures better Quality of Service (QoS) for users. Experimental results demonstrate that integrating AI and ML into cloud infrastructure significantly improves decision-making and resource management. This approach supports the development of intelligent, self-optimizing cloud systems capable of meeting modern computational demands.

II. Keywords

Cloud Computing, Artificial Intelligence, Machine Learning, Resource Allocation, Predictive Analytics, Workload Optimization, Dynamic Scaling, Quality of Service (QoS), Smart Cloud Systems, Data Analytics

ISBN: 978-81-996153-6-6

STEMEM -2026_A44

Arrhythmia Detection using Deep Learning on ECG Signals

AYILA VENKATA GOWTHAM

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Dr. N. Thirupathi Rao

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

Cardiovascular diseases are among the leading causes of mortality worldwide, with arrhythmia being a critical condition that requires early and accurate detection. Electrocardiogram (ECG) signals are widely used for diagnosing heart rhythm abnormalities; however, manual analysis of ECG data is time-consuming and prone to human error. This project presents a deep learning-based approach for automated arrhythmia detection using ECG signals.

The proposed system utilizes advanced neural network architectures such as Convolutional Neural Networks (CNN) and Recurrent Neural Networks (RNN) to effectively capture both spatial and temporal features of ECG waveforms. Preprocessing techniques including noise filtering, signal normalization, and segmentation are applied to enhance data quality. The model is trained on annotated ECG datasets to classify different types of arrhythmias and distinguish them from normal heart rhythms.

Experimental results demonstrate that the deep learning model achieves high accuracy and reliability in detecting arrhythmias, enabling faster and more consistent diagnosis. This system can assist healthcare professionals by providing real-time monitoring and early warning alerts, ultimately improving patient outcomes and reducing the risk of severe cardiac events.

II. Keywords

Arrhythmia Detection, Deep Learning, ECG Signals, Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), Biomedical Signal Processing, Healthcare Analytics, Pattern Recognition, Time-Series Analysis, Medical Diagnosis

ISBN: 978-81-996153-6-6

STEMEM -2026_A45

Glaucoma Detection Using CNN

BALASUBRAMANYAM SRIYANK

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mrs. D. L. Bhavani

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

Glaucoma is a serious eye disease that can lead to irreversible vision loss if not detected and treated at an early stage. Traditional diagnostic methods rely on manual examination of retinal images, which can be time-consuming and dependent on the expertise of ophthalmologists. This project proposes an automated glaucoma detection system using Convolutional Neural Networks (CNN) to improve the accuracy and efficiency of diagnosis.

The system utilizes retinal fundus images as input and applies image preprocessing techniques such as resizing, normalization, and enhancement to improve image quality. A CNN-based deep learning model is trained to extract relevant features from the images and classify them into glaucomatous and non-glaucomatous categories. Transfer learning techniques may also be employed using pre-trained models to enhance performance with limited datasets.

The proposed model achieves high accuracy in detecting glaucoma and reduces the dependency on manual diagnosis. This system can serve as a supportive tool for early screening and diagnosis, enabling timely medical intervention and reducing the risk of vision impairment. It demonstrates the potential of deep learning in advancing healthcare diagnostics and improving patient care.

II. Keywords

Glaucoma Detection, Convolutional Neural Networks (CNN), Deep Learning, Retinal Image Analysis, Medical Imaging, Computer Vision, Transfer Learning, Healthcare Technology, Image Classification, Early Diagnosis

ISBN: 978-81-996153-6-6

STEMEM -2026_A46

MobileNetV4-Based Garbage Image Classification for Sustainable Waste Management

BADIREDDY JANSI LATHA

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mrs. N. Renu

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

Improper waste management is a growing environmental concern, leading to pollution and health hazards. Efficient segregation of waste is essential for sustainable waste management practices. This project proposes a MobileNetV4-based garbage image classification system that automates waste categorization using deep learning techniques.

The system utilizes a lightweight and efficient MobileNetV4 architecture optimized for mobile and edge devices, enabling real-time image classification. It classifies waste into categories such as organic, recyclable, and non-recyclable materials. Image preprocessing and data augmentation techniques are applied to improve model robustness and accuracy under varying environmental conditions.

The proposed solution enhances waste segregation efficiency, reduces manual effort, and supports eco-friendly practices. By integrating AI into waste management systems, this project contributes to building smarter and more sustainable cities.

II. Keywords

Garbage Classification, MobileNetV4, Deep Learning, Waste Management, Image Classification, Sustainable Development, Computer Vision, Edge Computing, Environmental Monitoring

ISBN: 978-81-996153-6-6

STEMEM -2026_A47

AI Powered Investment Advisory and Portfolio Re-balancing System

BANDI SAI KRISHNA

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Dr. B. Prasad

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

Investment management requires continuous monitoring and strategic decision-making to maximize returns while minimizing risks. This project presents an AI-powered investment advisory and portfolio re-balancing system designed to assist investors in making data-driven financial decisions.

The system leverages machine learning algorithms to analyze historical market data, identify trends, and predict asset performance. It provides personalized investment recommendations based on user risk profiles and financial goals. Additionally, the system implements automated portfolio re-balancing strategies to maintain optimal asset allocation over time.

By integrating AI techniques, the proposed system enhances investment efficiency, reduces human bias, and enables smarter financial planning. It serves as a valuable tool for both novice and experienced investors in dynamic financial markets.

II. Keywords

Investment Advisory, Portfolio Management, Machine Learning, Financial Analytics, Predictive Modeling, Risk Management, Asset Allocation, AI in Finance, Automated Rebalancing

ISBN: 978-81-996153-6-6

STEMEM -2026_A48

Local Finder Service App

BANDI SUDHEER KUMAR

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mr. A. V. V. Chakraphani

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

With the rapid growth of urbanization, finding nearby services efficiently has become increasingly important. This project presents a Local Finder Service Application designed to help users locate nearby businesses and essential services such as hospitals, restaurants, and repair services.

The application uses location-based services and GPS technology to provide accurate and real-time information about nearby service providers. It integrates mapping APIs and user-friendly interfaces to enhance user experience. Additional features such as ratings, reviews, and service categorization improve the reliability and usability of the system.

The proposed app simplifies local service discovery, saves time, and enhances convenience for users. It demonstrates the practical application of mobile and web technologies in solving everyday problems.

II. Keywords

Location-Based Services, GPS, Mobile Application, Local Finder, Service Discovery, Mapping APIs, User Experience, Real-Time Data, Smart Applications

ISBN: 978-81-996153-6-6

STEMEM -2026_A49

Cybersecurity Intelligence Agent

BATCHU KIRANMAI

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mrs. Padda Nalini

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

With the increasing number of cyber threats, ensuring digital security has become a critical concern for organizations and individuals. This project introduces a Cybersecurity Intelligence Agent that utilizes artificial intelligence to detect, analyze, and respond to potential security threats.

The system employs machine learning algorithms to monitor network traffic, identify anomalies, and detect malicious activities in real time. It incorporates threat intelligence techniques to analyze patterns and predict potential cyber-attacks. Automated alerts and response mechanisms enhance the system's ability to mitigate risks effectively.

The proposed solution improves cybersecurity resilience by providing proactive threat detection and intelligent response capabilities. It highlights the role of AI in strengthening modern cybersecurity frameworks.

II. Keywords

Cybersecurity, Threat Detection, Machine Learning, Network Security, Intrusion Detection, AI in Security, Anomaly Detection, Threat Intelligence, Real-Time Monitoring

ISBN: 978-81-996153-6-6

STEMEM -2026_A50

Omni-Talk : All-in-One Conversational AI System

BETHA ANAND

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mrs. B. Bhagyasri

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

Conversational AI systems have become an essential part of modern digital interactions, enabling seamless communication between humans and machines. This project presents Omni-Talk, an all-in-one conversational AI system designed to handle multiple user interactions across various domains.

The system utilizes Natural Language Processing (NLP) and deep learning techniques to understand user queries and generate meaningful responses. It supports multi-functional capabilities such as customer support, information retrieval, and task automation. The integration of intent recognition and contextual understanding enhances the system's conversational accuracy.

Omni-Talk improves user engagement and efficiency by providing intelligent and interactive communication solutions. It demonstrates the potential of conversational AI in transforming digital experiences across industries.

II. Keywords

Conversational AI, Natural Language Processing, Chatbot, Deep Learning, Intent Recognition, Human-Computer Interaction, Virtual Assistant, AI Communication, Text Processing

ISBN: 978-81-996153-6-6

STEMEM -2026_A51

AI-Powered IP Spoofing Detection: A Deep Learning Approach with Power BI Visualization

BHEEMUNI MANIKANTA SWAMY

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mrs. Padda Nalini

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Abstract

IP spoofing is a significant cybersecurity threat where attackers manipulate IP packet headers to impersonate legitimate devices, enabling malicious activities such as Distributed Denial-of-Service (DDoS) attacks, data interception, and unauthorized access. Traditional detection methods often fail to identify sophisticated spoofing techniques due to their reliance on static rules and signature-based approaches.

This study proposes an AI-powered IP spoofing detection system using deep learning models to analyze network traffic patterns and identify anomalies in real time. The system leverages neural network architectures such as Convolutional Neural Networks (CNN) and Recurrent Neural Networks (RNN) to capture both spatial and temporal features of network data. The model is trained on labeled datasets containing both legitimate and spoofed traffic to enhance detection accuracy.

The proposed approach improves detection accuracy, reduces false positives, and provides a scalable solution for modern network security challenges. By combining deep learning with business intelligence tools, this system bridges the gap between advanced analytics and practical cybersecurity applications.

III. Keywords

IP Spoofing, Deep Learning, Network Security, Cybersecurity, Anomaly detection,CNN,RNN,Data Visualization, Intrusion Detection System (IDS)

ISBN: 978-81-996153-6-6

STEMEM -2026_A52

Recommendation System For Higher Education Using AI-ML

BHUPATHI SWATHI

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Ms. K. Lekhasree

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

Choosing the right educational path is a crucial decision for students, often influenced by multiple factors such as interests, academic performance, and career goals. This project presents an AI-ML based recommendation system designed to assist students in selecting suitable higher education options.

The system analyzes student data, including academic records, preferences, and aptitude, using machine learning algorithms to generate personalized recommendations. Techniques such as collaborative filtering and classification models are used to match students with appropriate courses and institutions.

The proposed system helps students make informed decisions, reduces confusion, and enhances career planning. It demonstrates the application of AI in education by providing intelligent and personalized guidance.

II. Keywords

Recommendation System, Machine Learning, AI in Education, Collaborative Filtering, Career Guidance, Predictive Analytics, Student Profiling, Decision Support System

ISBN: 978-81-996153-6-6

STEMEM -2026_A53

IoT Based Gas Detection and Ventilated Leakage Control for Kitchen

BONGU DIVAKAR REDDY

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mrs. A. Sirisha

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

Gas leakage in kitchens poses serious safety risks, including fire hazards and health issues. This project presents an IoT-based gas detection and automated ventilation control system designed to enhance kitchen safety.

The system utilizes gas sensors to continuously monitor the presence of hazardous gases such as LPG. When a gas leak is detected, the system triggers an alert and automatically activates ventilation mechanisms such as exhaust fans to reduce gas concentration. IoT technology enables real-time monitoring and remote notifications through connected devices.

The proposed solution provides a reliable and cost-effective approach to preventing accidents caused by gas leakage. It enhances safety, ensures quick response, and demonstrates the effectiveness of IoT in smart home applications.

II. Keywords

IoT, Gas Detection, Smart Kitchen, LPG Leakage, Sensor Technology, Automation, Safety System, Real-Time Monitoring, Embedded Systems

ISBN: 978-81-996153-6-6

STEMEM -2026_A54

Predicting CO2 Emission Trends using Regression and Time-Series Models

BORA PRASANTH

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mrs. B. Bhagyasri

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

Rising carbon dioxide (CO2) emissions are a major contributor to climate change, making accurate prediction essential for environmental planning and policy-making. This project focuses on predicting CO2 emission trends using regression and time-series modeling techniques.

The system analyzes historical emission data and applies statistical and machine learning models such as linear regression, ARIMA, and other time-series forecasting methods. Data preprocessing and feature engineering techniques are used to improve prediction accuracy.

The proposed model provides valuable insights into emission patterns and future trends, enabling better decision-making for environmental sustainability. It highlights the importance of data-driven approaches in addressing global climate challenges.

II. Keywords

CO2 Emissions, Time-Series Analysis, Regression Models, ARIMA, Climate Change, Predictive Analytics, Environmental Data, Forecasting, Sustainability

ISBN: 978-81-996153-6-6

STEMEM -2026_A55

Prostate Cancer Detection Using SVM and Random Forest

BUDDHA YASWANTH

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mrs. P. Sridevi

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

Prostate cancer is one of the most common cancers among men, and early detection is crucial for effective treatment. This project presents a machine learning-based approach for prostate cancer detection using Support Vector Machine (SVM) and Random Forest algorithms.

The system utilizes medical datasets containing patient information and diagnostic features. Data preprocessing techniques such as normalization and feature selection are applied to improve model performance. Both SVM and Random Forest classifiers are trained and evaluated to identify cancerous and non-cancerous cases.

The proposed model achieves high accuracy and reliability, providing a supportive tool for early diagnosis. It demonstrates the potential of machine learning in improving healthcare outcomes and assisting medical professionals in decision-making.

II. Keywords

Prostate Cancer Detection, Support Vector Machine, Random Forest, Machine Learning, Medical Diagnosis, Healthcare Analytics, Classification Models, Early Detection

ISBN: 978-81-996153-6-6

STEMEM -2026_A56

Stay Safe Security App with Scream Alert

CHAKALI TRIVENI

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Dr. Ch. Swapna Priya

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

Personal safety has become a growing concern, especially in emergency situations where immediate assistance is required. This project presents a Stay Safe Security Application integrated with a scream alert feature to enhance user safety.

The application uses smartphone sensors and audio recognition techniques to detect distress signals such as screams. Upon detection, it automatically sends alerts, including location details, to emergency contacts or authorities. Additional features such as panic buttons and real-time tracking further enhance security.

The proposed system provides a quick and effective response mechanism during emergencies, improving personal safety. It demonstrates the integration of mobile technology and AI for building intelligent safety solutions.

II. Keywords

Security App, Scream Detection, Emergency Alert, Mobile Application, Personal Safety, Location Tracking, Audio Recognition, Smart Security

ISBN: 978-81-996153-6-6

STEMEM -2026_A57

College Management System

CHUKKA DILEEPKUMAR

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mr. A. V. V. Chakraphani

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

Managing academic and administrative activities in educational institutions can be complex and time-consuming. This project presents a College Management System designed to automate and streamline various institutional processes.

The system includes modules for student management, faculty management, attendance tracking, examination records, and fee management. It utilizes database technologies to store and manage information efficiently, along with a user-friendly interface for easy access.

The proposed system improves efficiency, reduces manual errors, and enhances overall productivity within the institution. It demonstrates the importance of software solutions in modern educational management.

II. Keywords

College Management System, Database Management, Student Information System, Automation, Educational Software, Web Application, Data Management, Administrative Systems

ISBN: 978-81-996153-6-6

STEMEM -2026_A58

Startup Company Success and Failure Rate Prediction using Deep Learning

DASARI DINESH

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Dr. N. Thirupathi Rao

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

Startups play a crucial role in economic growth and innovation, but many fail due to various factors such as market conditions, funding, and management strategies. This project presents a deep learning-based approach to predict the success and failure rates of startup companies.

The system analyzes historical startup data, including financial metrics, market trends, and business characteristics. Deep learning models such as Artificial Neural Networks (ANN) are used to identify complex patterns and predict outcomes. Data preprocessing and feature engineering techniques are applied to improve model accuracy.

The proposed system provides valuable insights for investors, entrepreneurs, and stakeholders, enabling better decision-making and risk assessment. It highlights the role of AI in business analytics and strategic planning.

II. Keywords

Startup Prediction, Deep Learning, Artificial Neural Networks, Business Analytics, Predictive Modeling, Risk Analysis, Entrepreneurship, Data Science

ISBN: 978-81-996153-6-6

STEMEM -2026_A59

DocuVerify - AI-Based Document Forgery Detection

DODDI SYAMALA

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mrs. Mruna Dubey

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

Document forgery has become a significant concern in various sectors such as banking, education, and legal systems, leading to financial losses and security breaches. This project presents *DocuVerify*, an AI-based document forgery detection system designed to identify manipulated or counterfeit documents with high accuracy.

The proposed system utilizes advanced computer vision and deep learning techniques to analyze document images and detect inconsistencies such as altered text, signatures, stamps, and formatting anomalies. Image preprocessing methods, including noise reduction, contrast enhancement, and segmentation, are applied to improve feature extraction. Convolutional Neural Networks (CNN) are employed to learn complex visual patterns and distinguish between authentic and forged documents.

Additionally, the system integrates feature matching and anomaly detection techniques to enhance detection reliability. Experimental results demonstrate that the model achieves high precision and recall in identifying forged documents under varying conditions. The solution provides a robust, automated, and scalable approach for document verification, reducing dependency on manual inspection and improving security in digital and physical document workflows.

II. Keywords

ISBN: 978-81-996153-6-6

Document Forgery Detection, Artificial Intelligence, Computer Vision, Deep Learning, Convolutional Neural Networks, Image Processing, Security Systems, Pattern Recognition, Anomaly Detection

STEMEM -2026_A60

Real Estate-Hub

DUDDUPUDI SURESH

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mrs. N. Renu

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

The real estate sector involves complex processes such as property search, listing management, and transaction handling, which can be time-consuming and inefficient when managed manually. This project presents *Real Estate-Hub*, a comprehensive digital platform designed to simplify property buying, selling, and renting processes.

The system provides an integrated interface where users can search for properties based on location, price, amenities, and other preferences. It incorporates advanced filtering and recommendation features to enhance user experience. The platform utilizes database management systems to store and retrieve property information efficiently, along with secure authentication mechanisms to ensure user data safety.

Additionally, the system supports features such as virtual property viewing, user reviews, and real-time updates, making it more interactive and reliable. By digitizing real estate operations, the proposed solution improves transparency, reduces manual effort, and enhances decision-making for both buyers and sellers. It demonstrates the effective use of web technologies in transforming traditional real estate services.

II. Keywords

Real Estate System, Property Management, Web Application, Database Management, Property Search, Digital Platform, User Authentication, Smart Applications

ISBN: 978-81-996153-6-6

STEMEM -2026_A61

Network Intrusion Detection System Using Machine Learning

DUMPA SRI RAMA SATYA

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mrs. D. L. Bhavani

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Abstract

With the rapid expansion of digital networks, protecting systems from cyber-attacks has become a critical necessity. This project presents a Network Intrusion Detection System (NIDS) that leverages machine learning techniques to detect malicious activities and unauthorized access in network environments.

The system analyzes network traffic data and identifies patterns associated with normal and abnormal behavior. Data preprocessing techniques such as feature selection, normalization, and noise removal are applied to enhance model performance. Machine learning algorithms including Decision Trees, Support Vector Machines (SVM), and Random Forest are implemented to classify network activities as either benign or malicious.

The proposed system is capable of detecting various types of attacks, including denial-of-service (DoS), probing, and unauthorized access attempts. Experimental results indicate high detection accuracy and reduced false alarm rates. This project highlights the effectiveness of machine learning in strengthening cybersecurity and providing real-time threat detection in modern network infrastructures.

III. Keywords

Network Security, Intrusion Detection System, Machine Learning, Cybersecurity, Anomaly Detection, SVM, Random Forest, Network Traffic Analysis, Threat Detection

ISBN: 978-81-996153-6-6

STEMEM -2026_A62

Predictive Steel Quality Assessment Using Machine Learning

DURGA HARSHAVARDHAN

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mr.AVV.Chakraphani

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

ABSTRACT

The advancement of industrial automation and data-driven technologies has increased the demand for efficient and accurate quality assessment systems in manufacturing. This project presents a predictive steel quality assessment system using machine learning techniques to analyze and classify steel properties.The system utilizes data preprocessing and supervised learning algorithms to interpret input parameters such as chemical composition and mechanical properties, and predict the quality of steel. It integrates with industrial data sources to provide real-time analysis and decision support capabilities.Machine learning models are employed to improve prediction accuracy and adapt to variations in production data over time. The system is designed to deliver fast and reliable results, enhance production efficiency, and reduce material wastage. The proposed solution demonstrates the integration of artificial intelligence and data analytics in developing intelligent manufacturing systems that improve product quality and operational performance.

1) ***Keywords***

Machine Learning, Steel Quality Prediction, Data Preprocessing, Supervised Learning, Industrial Automation, Predictive Analytics, Material Classification, Manufacturing Intelligence, AI Systems, Quality Assessment

ISBN: 978-81-996153-6-6

STEMEM -2026_A63

Pathology Image Classification for Colorectal Cancer Prediction Using Experience Replay

GONNABATTHULA VANITHA

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Ms. K. Lekhasree

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

I. Abstract

Colorectal cancer is one of the leading causes of cancer-related deaths worldwide, and early detection plays a crucial role in improving survival rates. This project presents an advanced pathology image classification system for colorectal cancer prediction using deep learning techniques combined with experience replay mechanisms.

The system analyzes histopathological images to identify cancerous and non-cancerous tissues. Image preprocessing techniques such as normalization, segmentation, and augmentation are applied to improve data quality and model performance. Convolutional Neural Networks (CNN) are utilized to extract complex features from pathology images.

The integration of experience replay enables the model to retain and reuse previously learned information, improving learning efficiency and reducing the risk of overfitting. Experimental results demonstrate enhanced accuracy and robustness in cancer detection. The proposed system provides a reliable tool for assisting medical professionals in diagnosis and supports the advancement of AI-driven healthcare solutions.

II. Keywords

Colorectal Cancer Detection, Pathology Image Classification, Deep Learning, Convolutional Neural Networks, Experience Replay, Medical Imaging, Healthcare AI, Image Analysis

ISBN: 978-81-996153-6-6

STEMEM -2026_A64

Atlas QA - Multi-source and Multi-format Answering Platform

GUNJE BHANU PRASAD

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mrs. B. Bhagyasri

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Abstract

With the exponential growth of information across digital platforms, retrieving accurate and relevant answers from diverse sources has become a challenging task. This project presents *Atlas QA*, a multi-source and multi-format answering platform designed to provide precise and context-aware responses by integrating data from various structured and unstructured sources.

The system leverages Natural Language Processing (NLP) and deep learning techniques to understand user queries and extract meaningful information from text documents, databases, and web sources. It supports multiple data formats, including text, PDFs, and web content, ensuring comprehensive information retrieval. Advanced models such as transformer-based architectures are utilized to improve semantic understanding and answer generation.

The platform enhances information accessibility by delivering accurate, concise, and contextually relevant answers. It demonstrates the potential of AI-driven question-answering systems in improving knowledge discovery and decision-making across domains.

III. Keywords

Question Answering System, Natural Language Processing, Multi-source Data, Deep Learning, Transformer Models, Information Retrieval, AI Systems, Knowledge Extraction

ISBN: 978-81-996153-6-6

STEMEM -2026_A65

Real-Time Audio Transcription and Note-Taking App

GUNTI REKHA

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mrs. P. Sridevi

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Abstract

Efficient documentation of spoken information is essential in academic, professional, and business environments. This project presents a real-time audio transcription and note-taking application that converts speech into text and organizes it into structured notes.

The system utilizes advanced speech recognition technologies and Natural Language Processing (NLP) techniques to accurately transcribe audio input in real time. It incorporates noise filtering and language modeling to improve transcription accuracy under varying conditions. Additionally, the application includes features such as keyword extraction, summarization, and automatic note organization.

The proposed solution enhances productivity by reducing manual note-taking effort and ensuring accurate documentation. It demonstrates the integration of AI-driven speech processing technologies in building intelligent productivity tools.

IV. Keywords

Speech Recognition, Audio Transcription, Natural Language Processing, Real-Time Systems, Note-Taking App, Text Summarization, Voice Processing, AI Applications

ISBN: 978-81-996153-6-6

STEMEM -2026_A66

AI-Assisted Diagnosis of Myositis Using Blood Biomarkers and EMG Signals

GURALA SHANMUKH VARDHAN

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mrs. Padda Nalini

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Abstract

Myositis is a group of rare autoimmune muscle disorders characterized by inflammation, progressive muscle weakness, and elevated muscle enzymes. Early and accurate diagnosis remains challenging due to overlapping clinical features and variability in disease presentation. This study proposes an AI-assisted diagnostic framework that integrates blood biomarkers and electromyography (EMG) signals to improve detection accuracy and clinical decision-making. Key biomarkers such as creatine kinase (CK), C-reactive protein (CRP), and autoantibodies are analyzed alongside EMG signal patterns to capture both biochemical and neuromuscular abnormalities. Machine learning models, including supervised classification algorithms and deep learning techniques, are employed to identify patterns and correlations within multimodal data. Signal preprocessing, feature extraction, and data normalization are performed to enhance model performance. The proposed system aims to provide a non-invasive, efficient, and reliable diagnostic tool that supports clinicians in early detection and disease monitoring. Experimental results demonstrate improved diagnostic accuracy compared to conventional methods, highlighting the potential of AI-driven approaches in managing myositis.

Keywords

ISBN: 978-81-996153-6-6

Myositis ,Artificial Intelligence,Machine Learning,Electromyography (EMG),Blood Biomarker

STEMEM -2026_A67

ML-Based Early Warning System for Harmful UV Radiation

BODDU KANAKA TEJA

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mrs. T. V. Lakshmi Devi K

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Abstract

Excessive exposure to ultraviolet (UV) radiation poses serious health risks, including skin cancer, eye damage, and premature aging. This project presents a machine learning-based early warning system designed to monitor and predict harmful UV radiation levels in real time.

The system utilizes environmental data such as UV index, temperature, humidity, and geographical parameters to train predictive models. Machine learning algorithms such as regression models and ensemble techniques are employed to forecast UV intensity levels accurately. Data preprocessing and feature engineering techniques are applied to enhance prediction performance and reliability.

The system provides real-time alerts and recommendations to users when UV radiation exceeds safe thresholds, enabling preventive actions. This solution contributes to public health awareness and demonstrates the application of AI in environmental monitoring and safety systems.

Keywords

UV Radiation, Machine Learning, Environmental Monitoring, Predictive Analytics, Health Safety, UV Index Prediction, Real-Time Alerts, Data Analy

ISBN: 978-81-996153-6-6

STEMEM -2026_A68

Federated Learning System for Distributed Cold Chain Monitoring

BODDU YELMAJI

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Mr. V. V. R. L. Sastry

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Abstract

Cold chain systems are critical for preserving temperature-sensitive products such as pharmaceuticals, vaccines, and perishable food items. However, maintaining data privacy while monitoring distributed systems remains a major challenge. This project presents a federated learning-based system for distributed cold chain monitoring that ensures data security while enabling intelligent analysis.

The system utilizes IoT sensors to collect real-time temperature, humidity, and environmental data across multiple nodes in the supply chain. Federated learning techniques are employed to train machine learning models locally on each device, without transferring raw data to a central server. This approach enhances privacy while maintaining model accuracy.

The proposed system enables real-time monitoring, anomaly detection, and predictive maintenance of cold chain systems. It improves operational efficiency, reduces spoilage risks, and ensures compliance with safety standards. This project highlights the integration of AI, IoT, and privacy-preserving technologies in modern supply chain management.

Keywords

Federated Learning, Cold Chain Monitoring, IoT, Data Privacy, Distributed Systems, Temperature Monitoring, Predictive Maintenance, Smart Supply Chain

ISBN: 978-81-996153-6-6

STEMEM -2026_A69

Deep Learning Model for Early Detection of Deviated Nasal Septum (DNS)

DHEERAJ KUMAR DONDA

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Ms. K. Lekhasree

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Abstract

Deviated Nasal Septum (DNS) is a common medical condition that can lead to breathing difficulties and other complications if not diagnosed early. This project presents a deep learning-based model for the early detection of DNS using medical imaging techniques.

The system utilizes imaging data such as nasal scans and applies preprocessing techniques including noise reduction, normalization, and segmentation to improve data quality. Convolutional Neural Networks (CNN) are employed to extract intricate features and classify the presence of septal deviation. Transfer learning approaches are also utilized to enhance model performance with limited datasets.

The proposed model achieves high accuracy in identifying DNS conditions and provides a reliable tool for assisting medical professionals in diagnosis. Early detection through this system can lead to timely treatment and improved patient outcomes. The project demonstrates the potential of AI in advancing medical diagnostics and healthcare solutions.

Keywords

Deviated Nasal Septum, Deep Learning, CNN, Medical Imaging, Healthcare AI, Early Detection, Image Classification, Diagnostic Systems

ISBN: 978-81-996153-6-6

STEMEM -2026_A70

Sugarcane Yield Analysis and Prediction using YOLOv8

GULLIPALLI GOPI

Student, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Dr. Ch. Dinesh

Professor, Master of Computer Applications, Vignan's Institute of Information Technology(A)

Abstract

Accurate prediction of crop yield is essential for effective agricultural planning and resource management. This project presents a sugarcane yield analysis and prediction system using YOLOv8, a state-of-the-art object detection algorithm.

The system utilizes field images of sugarcane crops to detect and analyze plant features such as density, growth patterns, and health conditions. YOLOv8 is employed for real-time object detection and feature extraction, enabling efficient analysis of large-scale agricultural data. Image preprocessing and augmentation techniques are applied to improve model robustness under varying environmental conditions.

The proposed model provides accurate yield predictions and valuable insights for farmers, helping in better decision-making and crop management. It demonstrates the application of deep learning and computer vision in smart agriculture and precision farming.

Keywords

YOLOv8, Crop Yield Prediction, Sugarcane Analysis, Deep Learning, Computer Vision, Precision Agriculture, Object Detection, Agricultural Analytics

ISBN: 978-81-996153-6-6

STEMEM -2026_A71

AI-Based Health Monitoring system for Rubber Cultivation.

Avurupalli Manikanta

Student, Master of Computer Applications, Vignan's Institute of Information Technology

Mrs. N. Renu

Associate Professor, Master of Computer Applications, Vignan's Institute of Information Technology

Abstract

Rubber cultivation is highly sensitive to environmental conditions such as temperature, humidity, soil moisture, and disease outbreaks, which directly affect crop yield and quality. Continuous monitoring of these parameters using traditional methods is time-consuming and may lead to delayed decision-making. This project proposes an AI-Based Health Monitoring System for Rubber Cultivation that leverages advanced technologies to monitor plant health in real time and provide timely insights to farmers. The system integrates sensors and image-based data collection to gather information on soil conditions, weather parameters, and leaf health. Artificial Intelligence techniques, particularly Machine Learning and Deep Learning models, are used to analyse the collected data, detect early signs of plant stress or diseases, and predict potential risks. Image processing methods help in identifying leaf infections, discoloration, and nutrient deficiencies. The system provides automated alerts and recommendations, enabling farmers to take preventive actions and improve productivity. This intelligent approach reduces manual effort, enhances accuracy, and promotes sustainable agricultural practices.

Keywords:

Rubber Cultivation, Artificial Intelligence (AI), Machine Learning, Deep Learning, Crop Health Monitoring, Image Processing, Disease Detection, Smart Agriculture, Precision Farming, Sensor-Based Monitoring.

ISBN: 978-81-996153-6-6

STEMEM -2026_A72

SERVICE DESK TICKET CLASSIFICATION USING DEEP LEARNING

MADHU ILAVARAPU

Student, Master of Computer Applications, Vignan's Institute of information Technology(A)

Dr.Ch.Swapna Priya

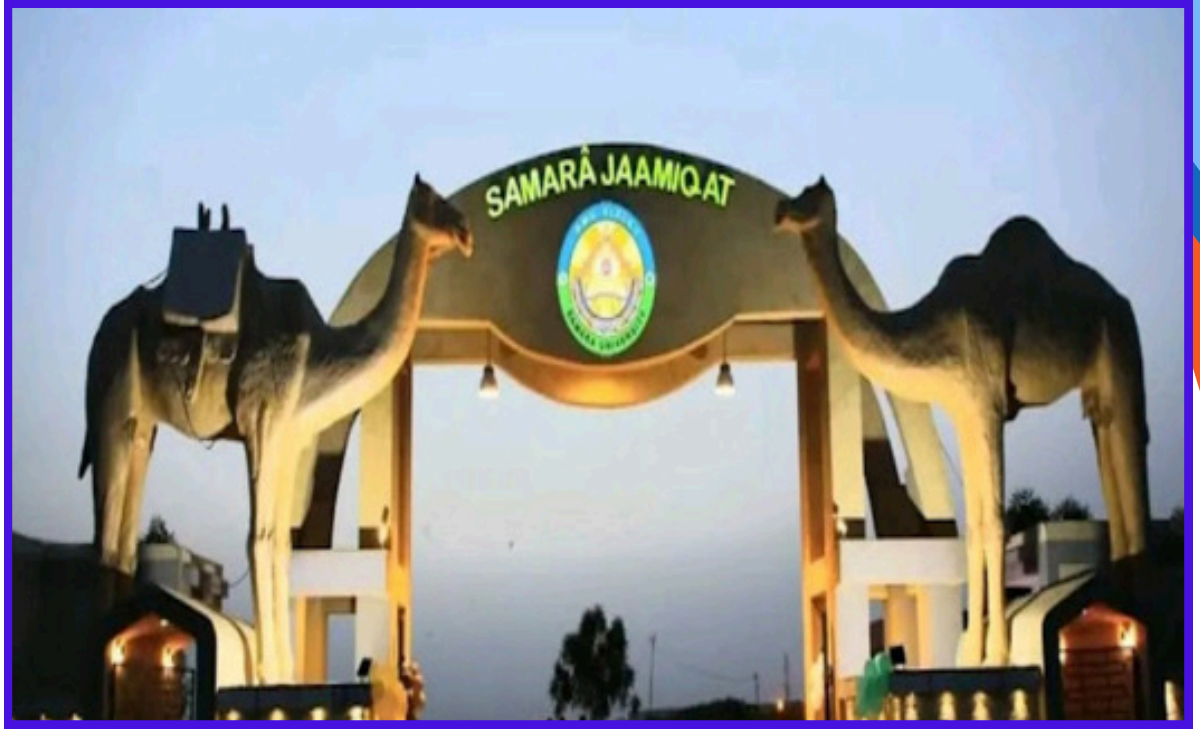
Associate Professor, Master of Computer Applications, Vignan's Institute of information(A) Technology

Abstract

Abstract Service desk systems in IT organizations receive a large volume of user tickets daily related to software issues, hardware failures, network problems, and access requests. Manually classifying these tickets into appropriate categories and assigning them to relevant support teams is time-consuming, error-prone, and leads to delayed resolution. To overcome these challenges, this project proposes an automated service desk ticket classification system using deep learning techniques. The proposed system uses Natural Language Processing (NLP) to analyze the textual content of service desk tickets such as issue descriptions and subject lines. A deep learning model is trained to automatically classify tickets into predefined categories like hardware, software, network, security, and others. The system improves classification accuracy over traditional rule-based and machine learning approaches by learning semantic relationships from historical ticket data. This automation helps reduce response time, improve service quality, and optimize support team workload. The system is scalable and can be integrated with existing IT service management tools..

Keywords

Service Desk, Ticket Classification, Natural Language Processing (NLP), Deep Learning, IT Service Management, Text Classification, Automation, Support Systems



The CRF is organizing the International Conference on Science, Technology, Engineering, Management, Education and Medical Sciences - 2026 (STEMEM-2026), March 28–29, 2026. The primary goal of this conference is to bring together experts and researchers from academia and industry to share their knowledge on implementations. To encourage faculty to pursue higher education and skill development in order to achieve. Encourage faculty and researchers to learn and develop new ideas from world-class excellence. To strengthen the institute through an alumni network. The conference features keynote addresses and invited talks by eminent invited speakers from around the world, as well as virtual presentations by researchers. This conference will also serve as a venue for young researchers to share and debate novel ideas. You are welcome to contribute papers and attend the conference.