Kristu Jayanti College

AUTONOMOUS **Bengaluru**

Reaccredited A++ Grade by NAAC | Affiliated to Bengaluru North University

Organised by

Department of Computer Science (UG)

in collaboration with

ST. MARY'S UNIVERSITY

San Antonio, Texas

INTERNATIONAL CONFERENCE ON COMPUTATIONAL INTELLIGENCE (ICCI 2025)

Converging Computational Excellence to Transcend Through Empowering Innovation for real-world challenges

CONFERENCE PROCEEDINGS

FEBRUARY 27 & 28, 2025

Department of Computer Science (UG)

In collaboration with

St. Mary's University, Texas, USA

Proceedings of the

International Conference

on

Computational Intelligence (ICCI 2025)

Converging computational excellence to transcend boundaries through empowering innovation for real-world challenges

February 27th and 28th, 2025

Proceedings of the International Conference on Computational Intelligence (ICCI 2025)

DISCLAIMER

FOREWORD

Fr. Dr. Augustine George, CMI
Principal, Kristu Jayanti College, Autonomous
Bengaluru

In an era of unprecedented technological evolution computational intelligence continues to redefine the boundaries of innovation bridging the gap between theoretical advancements and real-world applications. The **International Conference on Computational Intelligence** serves as a distinguished platform for researchers, academicians and industry practitioners to converge, exchange insights and contribute to the collective progress of this dynamic field. The theme of this conference, **"Converging computational excellence to transcend boundaries through empowering innovation for real-world challenges"** underscores the imperative need to harness the power of artificial intelligence, machine learning, data science and intelligent systems to address pressing global challenges. As computational intelligence becomes increasingly integral to fields ranging from healthcare and finance to cybersecurity and sustainable development it is essential to foster collaboration, innovation and interdisciplinary research.

These proceedings encapsulate a diverse spectrum of ideas, methodologies and breakthroughs that reflect the ingenuity and dedication of scholars and professionals committed to shaping the future of intelligent computing. Each contribution within this volume not only advances our understanding of computational intelligence but also inspires novel applications that can drive meaningful societal impact. As we embark on this intellectual journey let us embrace the spirit of inquiry, collaboration and transformative thinking that propels this domain forward. I extend my heartfelt gratitude to all authors, reviewers and organizing committee members whose relentless efforts have made this conference a resounding success. May these proceedings serve as a valuable resource for future explorations and innovations in computational intelligence.

Wishing you all an enlightening and inspiring experience at the **International Conference on Computational Intelligence**.

Fr. Dr. Augustine George, CMI
Principal
Kristu Jayanti College, Autonomous

ABOUT THE CONFERENCE

Computational Intelligence continues to drive innovation by bridging human-like problem-solving abilities with real-world challenges. Rooted in Neural Networks, Fuzzy Logic, and Evolutionary Algorithms this field enables systems to learn, adapt, and evolve revolutionizing industries such as healthcare, finance, education and sustainability. As technology advances Computational Intelligence plays a pivotal role in fostering autonomous decision-making, optimizing processes, and creating intelligent solutions that transcend traditional limitations.

The International Conference on Computational Intelligence (ICCI-2025) themed "Converging Computational Excellence to Transcend Boundaries Through Empowering Innovation for Real-World Challenges" brings together researchers, scholars and industry experts to exchange ideas, present cutting-edge research and explore future directions in the field. Beyond technical discussions the conference also highlights the societal, economic and environmental impact of Computational Intelligence fostering academia-industry collaboration for real-world solutions.

We are honored and deeply grateful to **St. Mary's University, Texas, USA** for their collaboration in hosting this conference. Their support and shared vision for academic excellence and research innovation have greatly enriched this initiative fostering an environment where knowledge, creativity, and interdisciplinary efforts thrive. This partnership stands as a testament to the power of global academic collaboration in advancing the frontiers of Computational Intelligence.

Within these proceedings, you will discover a wealth of insights, methodologies and groundbreaking research contributions that reflect the passion and dedication of our participants. On behalf of the organizing committee, we extend our heartfelt gratitude to all contributors, speakers, reviewers and attendees whose invaluable efforts have made this conference a vibrant hub of learning and discovery.

We hope these proceedings inspire continued exploration and collaboration, propelling the field of Computational Intelligence to new heights and shaping a smarter, more connected future for all.

[Conference Convenors - ICCI 2025]

Dr. K.Kalaiselvi

Mr.Ramanathan G

Editorial - ICCI 2025

It is with great pleasure and a deep sense of fulfillment that we welcome you to the proceedings of the International Conference on Computational Intelligence (ICCI-2025). As the editorial team, we take immense pride in presenting this compilation of research contributions that embody the spirit of innovation and intellectual rigor within the field of Computational Intelligence. These proceedings stand as a testament to the collaborative efforts and scholarly excellence of researchers, practitioners, and academicians who have contributed to this distinguished conference. The theme of ICCI-2025, "Converging computational excellence to transcend boundaries through empowering innovation for real-world challenges" underscores the transformative power of Computational Intelligence in addressing complex global issues. As technology continues to advance at an unprecedented pace the role of Artificial Intelligence, Machine Learning and related disciplines becomes increasingly vital in shaping a smarter, more interconnected world. The research presented here highlights cutting-edge advancements, emerging methodologies and practical applications that push the boundaries of innovation.

This conference has provided a dynamic platform for the exchange of knowledge, fostering discussions that bridge theoretical research with real-world implementations. We deeply appreciate the contributions of all authors who have shared their insights, the reviewers who have ensured the academic quality and rigor of these works, and the organizing committee whose dedication has made this event a success. We hope these proceedings serve as a valuable resource for scholars, researchers, and industry professionals inspiring further exploration and breakthroughs in Computational Intelligence. May this work contribute meaningfully to the ongoing journey of discovery, innovation, and problem-solving in the technological landscape.

Wishing you an insightful and enriching engagement with the research and ideas presented within these proceedings.

[Editorial Team]
Faculty Editors: Dr. Mary Jacob, Dr. Gopika S, Dr. Haripriya M P
Student Editors: Mr. Hemant Kumar, Ms. Hannah Jess John

ABOUT THE COLLEGE

Kristu Jayanti College, founded in 1999, is managed by "BODHI NIKETAN TRUST", formed by the members of St. Joseph Province of the Carmelites of Mary Immaculate (CMI). The institution strives to fulfill its mission to provide educational opportunities for all aspiring young people to excel in life by developing academic excellence, fostering values, creating civic responsibility, inculcating environmental concern and building global competencies in a dynamic environment.

The College is affiliated to Bengaluru North University and is reaccredited with grade 'A++' in 2021 by NAAC in the Third Cycle of Accreditation. The college is recognized by UGC under the category 2(f) & 12(B). The College has been accorded Autonomous Status since 2013 by the University Grants Commission, the Government of Karnataka & Bangalore University.

In the NIRF 2024, Our college has been ranked 60th place in the top 100 colleges in the country. The programmes of School of Management are internationally accredited by the Accreditation Council for Business Schools and Programs [ACBSP, USA]. The college was accorded 'DBT Star College status under the strengthening component' by the Department of Biotechnology, the Ministry of Science & Technology and the Government of India. The institution received first prize at the National Level for 'Clean and Smart Campus Award' from Shri. Dharmendra Pradhan, Minister of Education, Govt. of India.

In the India Today - MDRA survey 2024, Kristu Jayanti College, Bengaluru is consecutively ranked as the Best Emerging College of the Century at National Level for Commerce, Science, Arts and Social Work. At the National level, the survey ranked the college as 4th Best in BCA, 12th Best in MSW, 20th Best in BBA, 21st Best in Commerce and Arts, 26th Best in Mass Communication, 28th Best in Science Programmes. The College is ranked as 2nd Best in MSW, 3rd Best in BCA and Commerce, 4th Best in Arts and Science, 5th Best in Mass Communication and 6th Best in BBA programmes among the colleges in Bengaluru.

ABOUT THE DEPARTMENT

The Department of Computer Science (UG) with a legacy of over two decades stands among the top in the Nation and State for its BCA and BSc Programme. Offering specialized Programme in BCA Analytics, Cloud Computing, Cyber Security, IoT, BSc Data Science and AI/ML, the department seamlessly blends theory with hands-on experience, equipping students with industry-relevant skills, problem-solving abilities and cross-disciplinary teamwork.

To keep pace with evolving technology the Computer Academy, auspicious club of the department with over 2100 members bridges academia and industry through guest lectures, workshops, seminars, industrial visits, fests, exhibitions and community programs. Strong academic alliances with UiPath, SalesForce, Oracle Academy, Microsoft, AWS Educate, Infosys, Palo Alto, SAP and others ensure hands-on training, certifications and exposure to cutting-edge technology. The newly launched CS Skill Studio enhances students' expertise in emerging technologies while initiatives like Women in Data Science, Cyber Security, and Process Mining empower female students in the tech space.

The department supports Hybrid Learning through Kristu Jayanti Learning Management System (KJLMS) fostering a seamless online-offline learning experience. Additionally, the students are encouraged to pursue MOOC and NPTEL courses for self-paced learning.

Beyond academics the department instills social responsibility through Social Outreach Programme (SOP) and Computer Literacy Programme (CLP) contributing to societal development. With a commitment to academic excellence and industry impact our BCA and BSc Programme continue to set benchmarks in education and professional success.

Message from the Dean, Faculty of Sciences

Kristu Jayanti College, Bengaluru

It is with great enthusiasm that we present the Book of Abstracts for the International Conference on Computational Intelligence, a platform dedicated to exploring groundbreaking research and advancements in this ever-evolving field. Computational intelligence continues to redefine the boundaries of technology, driving innovation in artificial intelligence, machine learning, data science, and beyond. Research in this domain is not only shaping the future of intelligent systems but also addressing real-world challenges across industries.

My heartfelt appreciation to the Department of Computer Science (Undergraduate Programmes) for its commitment to fostering research excellence and for its initiative in collaborating with St. Mary's University, Texas, USA to elevate the scope and impact of this conference. Special commendation is due to the conveners for their relentless efforts in bringing together renowned resource persons who will illuminate emerging trends and advancements, providing valuable insights to all delegates.

This compilation of abstracts reflects the depth and diversity of research contributions that will be discussed during the conference. We hope it serves as a valuable resource, inspiring further inquiry and collaboration in computational intelligence.

May this conference serve as a catalyst for exploration, collaboration and innovation in computational intelligence. We look forward to the meaningful discussions and discoveries that will emerge from this gathering.

Wishing all participants a productive and intellectually stimulating experience!

Dr. Calistus Jude A.L.
Dean, Faculty of Sciences
Kristu Jayanti College, Autonomous

Message from the Dean of Science, Engineering, and Technology

St. Mary's University, Texas, USA

Dear Distinguished Colleagues,

On behalf of St. Mary's University of San Antonio, Texas, it is our honor and privilege to partner with Kristu Jayanti College on the International Conference on Computational Intelligence 2025 (ICCI2025).

We are excited to engage with such a prestigious group of scholars, practitioners, and students from around the globe. We have come together to share our latest research findings, innovative ideas, and practical applications in the domain of computational intelligence. The collaboration between our institutions underscores our shared commitment to advancing knowledge, promoting innovation, and addressing the complex challenges of our time through interdisciplinary research and cooperation.

I extend my heartfelt gratitude to the organizing committee, volunteers, and sponsors for their tireless efforts in making this conference a reality.

Once again, welcome to the 2025 International Conference on Computational Intelligence. I hope you will enjoy all that it has to offer!

Dr. Teresa A. Beam

Dean of Science, Engineering, and Technology
St. Mary's University

Message from the Head, Department of Computer Science (UG)

As the Head of the Department of Computer Science, I am honored to welcome you to the International Conference on Computational Intelligence (ICCI-2025). This gathering serves as a testament to the collective pursuit of knowledge, innovation, and excellence in the ever-evolving domain of computational intelligence.

The research and ideas presented in this conference reflect the diverse advancements shaping the future of intelligent computing—ranging from deep learning and evolutionary algorithms to data-driven decision-making and real-world applications. Each contribution represents a step toward solving complex challenges and enhancing the role of computational intelligence in society.

I encourage all participants to actively engage with these insights, challenge conventional boundaries, and explore new collaborations. Interdisciplinary innovation is at the heart of computational intelligence, and this conference provides the perfect platform to inspire fresh perspectives and meaningful dialogue.

I extend my heartfelt appreciation to all authors, reviewers, and organizers who have worked tirelessly to bring this event to life. Your dedication has made this an enriching platform for sharing knowledge and fostering future breakthroughs.

On behalf of the Department of Computer Science, I wish you all a productive and inspiring ICCI-2025, where ideas converge to shape the future of computational intelligence.

Prof. Sevuga Pandian A

Head, Department of Computer Science (UG)

CONTENTS

ICCI2025001: PRIORITIZATION OF DISEASE CANDIDATE METABOLITES THROUGH ADAPTIVE CUCKOO SEARCH ALGORITHM

Dr. S. Spelmen Vimalraj[1], Dr. Vignesh Ramamoorthy H[2], Mr. N. Karthik[3], Dr. R. Porkodi[4]

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ABSTRACT

To determine which disease-related metabolites are strongly associated with the corresponding disease. The Existing methods InfDisSim, SLWBMISM, MPN-SLWBMISM identified enormous amount of disease related metabolites. Even though it identified enormous metabolites it is essential to extract the high prioritized metabolites towards the disease to study about the complex diseases and to develop the drug. To achieve this Adaptive Cuckoo Search Algorithm (ACSA) has been proposed in this research work. The equilibrium between local and global random walks could not be maintained by the Random Walk algorithm that was in use at the time. In order to successfully maintain a balanced link between local and global random walks using switching parameters, this method makes use of the Cuckoo Search Algorithm (CSA). However, this algorithm's switching value is fixed and insufficiently valid to evaluate how a dynamic switching parameter affects CSA performance. In order to address the aforementioned issue, this study presented an improved and optimized random walk method known as the adaptive cuckoo search algorithm (ACSA), which is used to rank disease-related candidate metabolites based on scores by dynamically adjusting switching parameters. By improving the connectivity between metabolites linked to the same disease as well as for diseases whose metabolites belonged to different pathways, ACSA contributes to increased efficiency. The key metabolites that are closely linked to the particular medical condition were extracted using the suggested method in comparison to the current approaches. The suggested approach produced a recall rate of 96.7% and a precision of 97.5%.

Keywords: *Subcellular Localization, Metabolic Pathway Network, Random Walk Algorithm, Cuckoo Search Algorithm, Switching Parameters.*

ICCI2025002: A MULTI-MSB REPLACEMENT BASED APPROACH FOR HIGH CAPACITY DATA HIDING IN COLOR IMAGES

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ABSTRACT

With the rapid development of cloud computing recently, image privacy has drawn intensive attention worldwide. In this paper, we propose a novel technique for data hiding and demonstrate its effectiveness in embedding information into color images. Our proposed efficient high capacity multi-Most Significant Bit (multi-MSB) replacement method can hide a large amount of data in an image while maintaining a high visual quality of restored images. Our multi-MSB replacement based approach hides secret messages in multiple most significant bits (MSBs) of a pixel. To demonstrate its effectiveness, we applied our method to many color images in a database widely used by the research community. The experimental results showed that the data embedding rate (DER) of our high capacity multi- MSB replacement method ranges from 4.6964 bit per pixel (bpp) to 15.408[1] bpp for color images, with an average of 9.2065 bpp. To measure the visual quality of reconstructed images, we employed two metrics: the peak signal-to-noise ratio (PSNR) and the structural similarity (SSIM). Our experimental results showed an average PSNR of above 50 dB and an average SSIM of higher than 0.98 for recovered images, which indicates that the restored images and original ones are visually indistinguishable. The source code is made publicly available at https://github.com/ykzzyk/A-Multi-MSB-Replacement-Based-   Approach-for-High-Capacity-Data-Hiding-in-Colour-Images.

Keywords: Reversible data hiding, RGB planes, colour images, multi-MSB replacement, location map.

ICCI2025003: DISSOLVING NODE IDENTIFICATION ISSUES IN GRAPH BASED METHOD FOR CHARACTER RECOGNITION

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ABSTRACT

Character recognition has evolved as a critical component in various researches such as image processing, automated data entry, and digital archiving. Traditional methods often struggle with variations in font, size, and orientation, making robust recognition a challenging task. This paper proposes a novel graph-based method for character recognition, which leverages the structural and topological properties of characters.

In the proposed approach, characters are represented as graphs where nodes correspond to critical points (e.g., junctions, endpoints) and edges represent the connecting strokes. This graph representation preserves the geometric and structural information of the characters, enabling more effective handling of variations. The recognition process involves the following key steps: [1]Graph Construction: Extracting significant points and constructing the graph representation of the character.

[2]Feature Extraction : Utilizing graph-theoretic features such as node degree, path length, and sub graph isomorphism to capture the unique characteristics of each character.[3]Graph Matching: Comparing the constructed graph with pre-defined template graphs using graph matching algorithms to identify the character.[4]Classification: machine learning techniques to classify the character based on the extracted features and matching results. The proposed method is evaluated on standard character recognition datasets, demonstrating superior performance in terms of accuracy and robustness against distortions and variations compared to traditional pixel-based methods. This graph-based approach provides a promising direction for future research and applications in character recognition.

***Keywords*:** *Harris Corner Detector, Shi-Tomshi Corner Detector, Otsu's Method, connected component analysis, Graph Edit Distance.*

ICCI2025004: USE CASES OF GENERATIVE AND PREDICTIVE AI FOR ENHANCING SECURITY IN IOT AND CLOUD SYSTEMS

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ABSTRACT

The rise of Internet of Things (IoT) devices and cloud computing has revolutionized the entire universe of the internet to make things easier; however, it has introduced new security risks, such as data breaches, unauthorized access, and DDoS attacks, which traditional defenses struggle to address. This paper explores how Generative AI and Predictive AI can address these vulnerabilities and keep them safe in step towards our security. By reviewing the literature and analyzing case studies, we categorize the key applications of these AI technologies in enhancing the security of IoT and cloud systems, including predictive threat analysis and synthetic data generation for a swift Intrusion Detection Systems (IDS). Our study enlightens the capacity of AI-driven security systems to improve threat detection and automated steps toward the security of environments, as well as to discuss challenges such as privacy concerns, model interpretability, and IoT resource constraints. This study underscores the roles of Gen AI and predictive AI in understanding and developing adaptive, resilient defensive systems for IoT and cloud environments.

*Keywords***:** *Generative AI, Cloud Security, Iot Security, Threat Intelligence, Predictive AI*

ICCI2025005: LOCATING VITAL CONTRIBUTORS IN SOCIAL COMMUNITIES

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ABSTRACT

The Locating Vital Contributors in Social Communities study suggests a sound process for identifying important people whose actions have a big influence on community dynamics. maintaining engagement and promoting meaningful interactions in social groups depend on the ability to identify key contributors. The study highlights how sophisticated computational

methods may be used to reveal hidden impact and connectivity patterns in digital social environments. Through improving our comprehension of community dynamics and recognizing key players, we open doors for more successful approaches to platform design and community management, which will eventually improve the social experiences of millions of users globally, the system seeks to identify not only the most active content producers but also the powerful intermediaries who unite different communities. We proposed a E-based application, such that it takes the unique ID of the user with social community to identify whether the user is a vital contributor for the social community. Hence it gives importance for necessary things of the character of user to identify the vital contributor.

Keywords: *Vital Contributors, Social Communities, Powerful intermediaries, Key Influencers, Collaborative Communities.*

ICCI2025006: XAI-EBCD: ENHANCED BREAST CANCER DETECTION INTEGRATING OPENCV FOR TRANSPARENT AI-DRIVEN ANALYSIS

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ABSTRACT

This paper explores the incorporation of Explainable Artificial Intelligence (XAI) with OpenCV to enhance breast cancer detection. XAI techniques are pivotal in making AI-driven medical diagnoses transparent, thereby fostering trust among clinicians. By utilizing OpenCV, a powerful computer vision library, this study leverages image processing techniques to enhance the significant performance and interpretability of AI models in detecting breast cancer. In this paper, proposes a system that combines deep learning techniques with XAI methods which include saliency maps and Grad-CAM, to highlight critical areas in mammogram images, ensuring that the decision-making process to accurate and understandable. Experimental results demonstrate that the integration of XAI and OpenCV not only boosts detection performance but also provides clear visual explanations, making AI-driven analysis more transparent. This approach holds significant potential for advancing early breast cancer detection also supporting clinicians in making informed decisions.

ICCI2025007: FORECASTING PROPERTY VALUES: A MACHINE LEARNING APPROACH USING LIGHTGBM AND HYBRID GRADIENT- BOOSTED ENSEMBLE WITH CONTEXTUAL FEATURE AUGMENTATION (HGBE-CFA)

Sreekanth Rallapalli[1] , M G Varun[2]

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ABSTRACT

The accurate forecasting of property values is a critical task in real estate, impacting buyers, sellers, investors, and policymakers alike. Traditional methods rely on linear models for property valuation that do not record the challenges and complexities of the real estate market. This paper presents a machine-learning approach using LightGBM (Light Gradient Boosting Machine) to predict property values with high accuracy. LightGBM, known for its speed and efficiency in handling large-scale data, is applied to a comprehensive dataset containing various features such as location, property characteristics, and market conditions. Through rigorous data preprocessing, feature engineering, and model optimization, the proposed approach significantly improves prediction performance over traditional models. The findings show that LightGBM not only catches non-linear correlations in the data but also offers insightful information about the significance of features, facilitating better decision-making in the real estate industry. The potential of cutting-edge machine learning methods like LightGBM to transform real estate appraisal and improve market transparency is demonstrated by this study.

ICCI2025008: OPTIMIZING EMPLOYEE PROMOTION DECISIONS: A NOVEL MACHINE LEARNING FRAMEWORK FOR PREDICTIVE ANALYSIS BY USING GBM CATBOOST

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ABSTRACT

In the evolving landscape of human resource management, making informed promotion decisions is crucial for organizational success. Traditional methods often rely on subjective assessments, leading to potential biases and inefficiencies. This paper introduces a novel machine learning framework for optimizing employee promotion decisions using Gradient Boosting Machines (GBM) with a focus on CatBoost. The proposed approach leverages the powerful capabilities of CatBoost, which excels in handling categorical features and offers robustness against overfitting, to predict promotion outcomes with high accuracy.We conduct an extensive analysis on a real-world dataset, where features such as employee performance metrics, tenure, and behavioral indicators are incorporated to build a predictive model. The framework demonstrates superior performance in identifying promotion- worthy candidates by reducing classification errors and improving decision-making transparency. Our results indicate that the CatBoost-based model significantly outperforms traditional methods and other machine learning algorithms in terms of predictive accuracy, precision, and recall. Furthermore, the model's ability to provide interpretable insights into the factors influencing promotion decisions makes it a valuable tool for HR professionals seeking to enhance fairness and efficiency in promotion processes. This study highlights the potential of machine learning frameworks like GBM with CatBoost in transforming HR practices and contributing to a more data-driven organizational culture. Keywords— Employee Promotion, Machine Learning, Gradient Boosting Machines, CatBoost, Predictive Analysis, Human Resource Management, Promotion Decision Optimization, Classification Algorithms, HR Analytics, Data-Driven Decision Making

Keywords*: Data-Driven, GBM, Gradient Boosting Machines, metrics*

ICCI2025009: FROM FARM TO FORK: EIPT – ETHEREUM'S IMPACT ON PRODUCE TRACEABILITY

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ABSTRACT

This paper explores the transformative role of Ethereum's blockchain technology in enhancing traceability within the produce supply chain, from farm to fork. By leveraging Ethereum's smart contracts and decentralized ledger, this study delves into how the Ethereum-based Produce Traceability (EIPT) system ensures the integrity, transparency, and accountability of every step in the supply chain. The EIPT framework facilitates real-time tracking of fruits and vegetables, providing consumers and stakeholders with verifiable data on the origin, handling, and journey of produce. This paper also examines the challenges and opportunities associated with implementing Ethereum in agricultural traceability, including scalability, security, and adoption hurdles. By highlighting case studies and potential applications, the research underscores Ethereum's potential to revolutionize the produce industry, paving the way for a more sustainable and trust-driven supply chain ecosystem.

Keywords: *Ethereum, Produce Traceability, Blockchain Technology, Smart Contracts, Supply Chain Transparency, Agricultural Sustainability.*

ICCI2025010: ENHANCING SOFTWARE QUALITY PREDICTION THROUGH SOURCE CODE ANALYSIS WITH THE FIREFLY ALGORITHM

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ABSTRACT

For software systems to operate reliably and effectively, software quality assurance is essential. Conventional techniques for predicting software quality frequently rely on manual code inspection and testing, which can be laborious and prone to errors. This study suggests a unique method for predicting software quality assurance through deep learning and data mining analysis of source code. Developing an automated system that forecasts software quality using source code analysis is the primary goal of the project. In order to identify significant patterns and characteristics from the source code and capture both structural and semantic information,

the suggested system makes use of data mining techniques. A type of deep learning model employed to understand the intricate connections between software and the extracted features is the convolutional neural network (CNN). A large collection of source code samples and related quality metrics will be gathered in order to achieve this goal. The source code samples will be used to extract several code metrics, including code complexity, code duplication, and code smells. The data mining and deep learning models will use these metrics as input features. Pre-processing will be applied to the gathered dataset to address any noise or inconsistent data. The most pertinent and instructive elements for software quality prediction will be found using feature selection and dimensionality reduction approaches. Using the quality metrics and extracted features, deep learning algorithms will be developed and optimized using the training set. The models will undergo optimization processes, including hyper parameter tuning and regularization, to achieve optimal performance and generalization capabilities. The trained models will be evaluated using the validation set, fine- tuning them if necessary.

Keywords: *Code smell, Data mining, Deep learning, Software quality, Source code analysis*

ICCI2025011: DEEP INTEGRATIVE FRAMEWORK TOWARDS OPINION CLASSIFICATION AND OPINION RANKING OF ONLINE PRODUCT REVIEW USING FUZZY LOGIC TECHNIQUE

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[2] *Associate Professor, Department of Computer Applications, Madurai Kamaraj University, Madurai.*

ABSTRACT

Opinion mining is a type of natural language processing towards classification and ranking of the opinion to the product provided as customer review. Customer reviews to the product is extracted by web crawlers from the e commerce application which contains structured, semi structured and unstructured reviews in various levels like documents, sentence, and word. However many semantic approaches has been employed for opinion extraction on subjectivity analysis and sentiment analysis but opinion extraction on basis of aspect level has less attention in research community due to uncertain factors such as opinion randomness and incompleteness. In this work, a novel deep integrative framework towards opinion classification and opinion ranking of online product reviews is carried out using fuzzy logic.

Fuzzy logic technique is employed to reduce uncertainty in the review towards realistic representation of the review. Realistic review is preprocessed using the stop word removal, stemming and tokenization process. Preprocessed review containing opinion words is processed to determine the user intention and opinion words using part of speech tagging. Sentiment classification and Sentiment Score is computed to the each tokenized word vector as positive word vector and negative word vector. Feature vector is generated on the generated scores. Fuzzy rules is used for opinion classification and opinion ranking on significant aspect of the product review represented in the feature map. Experimental analysis of the current model is analyzed using Amazon product review dataset crawled from Amazon ecommerce application. Dataset contains 35000 customer reviews for product reviews. Validation is implemented to evaluate the performance of the framework. It is verified that proposed architecture provides excellent outcomes against conventional approaches.

Keywords: *Opinion Classification, Opinion Ranking, Online Product Reviews, Fuzzy logic, Fuzzy Rules*

ICCI2025012: PYTHON'S ROLE IN ADVANCEMENTS OF IMAGE PROCESSING

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ABSTRACT

This term paper delves into the realm of image processing, focusing on advanced techniques implemented with the Python programming language. The study encompasses a comprehensive review of state-of-the-art methodologies, including deep learning-based approaches, image segmentation, and feature extraction. Practical implementations using popular Python libraries such as OpenCV and TensorFlow are showcased, demonstrating their effectiveness in enhancing image analysis tasks. The paper aims to provide a nuanced understanding of the advancements in image processing, their applications, and the practical implications for fields like computer vision and medical imaging.

Keywords: *Image processing, Python programming, deep learning, image segmentation, feature extraction, OpenCV, TensorFlow, Convolutional Neural Networks (CNNs), computer vision, image enhancement, object detection, transfer learning, pre-trained models, histogram*

equalization, image classification, facial recognition, machine learning, data augmentation, edge detection, real-world applications.

ICCI2025013: PREDICTION OF CRYPTOCURRENCY PRICES OF BITCOIN, ETHEREUM AND SOLANA, AND EXPLORING THE CORRELATION USING SOCIAL SENTIMENTS: A MACHINE LEARNING APPROACH

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ABSTRACT

Cryptocurrencies like Bitcoin, Ethereum, and Solana have become significant asset classes in the financial market because of their high volatility and potential for significant returns. Thus, academics are working harder to forecast the future values of these cryptocurrencies using both traditional time series analysis and machine learning methods. This study used two datasets with various periods to test the forecasting ability of three machine learning algorithms on Bitcoin's future pricing. The results showed that the Random Forest algorithm was the most accurate, underscoring its potential as a tool for forecasting Bitcoin's future pricing. By choosing characteristics that accounted for cryptocurrency-specifics, the Random Forest algorithm was also used to predict Ethereum prices, proving its superiority over other machine learning algorithms in terms of offering useful information for traders and investors in the Bitcoin market. In light of the inherent unpredictability and extreme volatility of cryptocurrency prices, the study also highlighted the need for caution when interpreting the outcomes of price projections. The TextBlob package was used to do sentiment analysis on a sample of tweets about cryptocurrencies, and the results showed that there was a generally neutral attitude towards cryptocurrencies on Twitter with a mix of positive and negative attitudes. These results show the potential of sentiment analysis on social media data as a tool for tracking the public's perception of cutting-edge technologies.

ICCI2025014: IMPLEMENTATION OF CNN AND KERAS TO DETERMINE ACCURACY FOR BRAIN TUMOR IMAGING

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ABSTRACT

Due to its excellent efficiency and accuracy, convolutional neural networks (CNNs) are rapidly being used in the field of medical imaging. In this study, we suggest a CNN-based method for the precise identification and categorization of brain tumors in medical pictures. Our model is trained using a dataset of brain MRI images, and its performance is assessed using a different validation set. Our findings demonstrate that our CNN model outperforms conventional machine learning methods in terms of tumor detection and classification accuracy. Moreover, we offer details on CNN model optimization, including architecture selection, hyper parameter tweaking, and data augmentation methods. Overall, our method shows the promise of applying deep learning techniques to medical picture analysis. The ability of doctors to make educated judgements about the diagnosis, treatment, and monitoring of numerous diseases is made possible by medical imaging, which is a crucial component of healthcare. Brain tumors are one such condition that needs a precise diagnosis and course of therapy. Unfortunately, typical machine learning algorithms have limits in terms of accuracy and efficiency, and manual examination of medical pictures can be time-consuming. Deep learning techniques like CNNs, which have demonstrated promise in the processing of medical images, have arisen as a result of this. In this work, we suggest utilizing CNNs in conjunction with Keras, a well-liked deep learning package, to precisely identify and categories brain tumors in medical photos. In order to train our CNN model, we first use a dataset of brain MRI scans that consists of both tumor and healthy pictures. On a different validation set, which is made up of photos that weren't

utilized during training, we then assess how well the trained model performed. Our findings demonstrate that our CNN model outperforms conventional machine learning methods in tumor identification and classification by achieving high accuracy.

Keywords: CNN , neural networks, Deep learning, brain tumors, data augmentation methods

ICCI2025015: BLOCKCHAIN ENABLED PRIVACY-PRESERVING DATA SECURITY IN E-HEALTH SYSTEMS

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ABSTRACT

The increasing risks of cyberattacks, breaches in data and unauthorized access to sensitive medical information in healthcare systems called for the motivations in this paper. Data privacy, integrity and transparency are some of the issues for which traditional centralized models lack robustness, making patient records vulnerable. Blockchain demonstrates a potential solution to this challenge, presenting itself in the decentralized, tamper-proof structure with cryptographically secured processes. Due to providing secure, transparent and immutable transactions, blockchain can protect patient data while ensuring access only for authorized parties within a trustworthy health care environment. The growing number of cloud-based e-health systems is accelerating owing to advancements in the management of Electronic Health Records (EHR), illness analysis and medication provision. However, conventional e-health systems are susceptible to security problems during authentication, data storage and transactions.

This work aims to address vulnerabilities in current healthcare infrastructures by designing a decentralized architecture that ensures tamper-proof storage and access to sensitive patient data. Data transfer at every level necessitates the encryption of information via key methods, therefore enhancing security and addressing user privacy concerns. By using the advantageous aspects of blockchain in electronic health records, a tamper-resistant system may be developed to thwart attacks by suspicious intruders.The objective of this work is to design a blockchain-based secure framework for e-health systems that enhances the privacy, security and integrity of medical data transactions.

ICCI2025016: PREDICTING THE EFFECT OF EARLY TRAUMATIC EXPERIENCE ON FEW PSYCHOLOGICAL VARIABLES AMONG EMERGING ADULTS: COMPARISON BETWEEN STRUCTURAL EQUATION MODELING AND DECISION TREE ANALYSIS

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ABSTRACT

Emerging adulthood is a stage of shift from adolescence to adulthood, defined by making important personal and professional decisions. Several factors, including early traumatic experiences, influence the experience of self-esteem, a crucial aspect of human development during emerging adulthood. However, personal resourceful traits such as resilience and quality of life have gained significance in recent years in mediating the influence of traumatic experiences on self, especially during this transition period of life. The aim of the present study is to understand the efficiency of the traditional factor analysis method and novel machine learning algorithm in predicting the effect of early traumatic experience on self-esteem among emerging adults, with resilience and quality of life serving as mediators. The data was collected from 285 emerging adults aged 18 to 25, including 160 females and 125 males. The data was analyzed using conventional Structural Equation Modeling (SEM) and advanced Decision tree analysis methods, and the results of these methods were compared for accuracy. The results indicated that the structural equation model is more accurate in predicting the effects of early traumatic experiences on self-esteem among emerging adults compared to decision tree analysis. While effective in essential evaluation, the decision tree must be modified further to improve its prediction reliability. Conventional SEM is preferable for studying psychological variables such as resilience, self-esteem, and quality of life because it provides a comprehensive understanding of the complicated relationships between latent variables.

Keywords: *Traumatic experience, resilience, quality of life, self-esteem, structural equation modeling, decision tree analysis.*

ICCI2025017: FORETELLING FRAUD IN FINANCIAL PAYMENT SERVICES WITH MACHINE LEARNING ALGORITHMS

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ABSTRACT

In the realm of financial transactions, it is paramount to actively identify and mitigate risks to enhance customer experience and reduce financial losses. This study associates various machine learning algorithms for predicting financial transaction legitimacy. The algorithms used include MLP Regressor, Random Forest Classifier, Complement Naive Bayes, M [1] LP Classifier, Gaussian NB, Bernoulli NB, LightGBM Classifier, AdaBoost Classifier, K-Nearest Neighbors Classifier, Logistic Regression, Bagging Classifier, Decision Tree Classifier, and Deep Learning techniques. The study discovered that the Random Forest Classifier performed best on unbalanced datasets, with an amazing 99.97% accuracy. However, the Bagging Classifier was the most effective for balanced datasets, with an accuracy of 99.96%, precision of 99.95%, recall of 99.98%, and F1-score of 99.96%.

***Keywords**- Pre-Processing, fraud detection, credit card, Random Forest Classifier, MLP Classifier, Gaussian NB, Logistic Regression, Deep Learning*

ICCI2025018: BACTERIUM COLONIES WITH IMPROVED OPPOSITION BASED LEARNING FOR MEDICAL DATA CLUSTERING

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ABSTRACT

The clustering of data procedure entails grouping the data objects into different teams according to shared characteristics. Recently, the Bacterium Colony Improvement (BCI)

technique has been applied to overcome a data clustering issue. Yet, the conjunction rate of BCI is extremely low. In our article, an opposition-based learning technique (OBL+BCI) that increases the effectiveness of the data clustering problem and speeds up BCI's convergence rate is presented. The efficiency of the suggested data clustering strategy is assessed using 10 renowned UCI machine learning example data. The results of the experiment reveal that the OBL+BCI data clustering strategy delivered superior outcomes when compared to existing data clustering techniques.

Keywords: *Convergence Rate, Opposition–Based, Bacterium Colony Improvement, Bacterium Foraging Improvement.*

ICCI2025019: ARTIFICIAL INTELLIGENCE REDEFINED AUTHORSHIP: AN UNPRECEDENTED EVOLUTION IN THE FIELD OF ART AND LITERATURE

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ABSTRACT

This article will look at the relationship, between artificial intelligence (AI) and literary and artistic creativity, in order, to see how AI is impacting and altering creative processes in these fields. For example, GANs, DeepDream, AIVA, etc. are the current and foreseeable applications of artificial intelligence (AI), which create moral dilemmas. This study's hybridization of literature theory, art criticism, and computer science gives it a cohesive modern viewpoint on creativity; such as [1] *the Road* by Ross Goodwin, *The Day A Computer Writes a Novel*, etc. Artificial intelligence is only going to cause further changes in the creative world, which will affect our definition of artistic and literary originality. It describes how various advancements in the literary and artistic spheres, particularly in the field of creative technology, have taken place in the years since, changing the fundamental nature of art; This project showed that "… artificial intelligence (AI) could be used to both generate literary content and produce works that could compete in literary competitions" (Geere, 2016). The study also contributes

to our understanding of the intricate connections between these technologies and creative practices that explore their potential for pushing the boundaries of artistic expression and developing cutting-edge methods of audience participation. The creative landscape, is being swiftly altered by artificial intelligence, which is, also, redefining what it means to be creative in literature and the arts. Artificial intelligence has the ability to unleash human creativity; "AI algorithms have the capacity to learn from individual preferences, enabling the creation of art pieces or music playlists that cater specifically to the tastes of a single individual" [25].

Keywords: *Artificial Intelligence (AI), Authorship, Ethical, Generative, Technology, Art, Literature, etc.*

ICCI2025020: ENHANCING USER EXPERIENCE IN ONLINE TOURISM THROUGH A MERN STACK WEB APPLICATION

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ABSTRACT

The traditional approach to tourism planning involves manual efforts by tourists to gather information about destinations, nearby facilities, and weather conditions from various sources. This method is not only time-consuming but also prone to inaccuracies and inconsistencies. Moreover, the lack of a centralized platform for submitting feedback and booking services makes the process cumbersome. To address these challenges, this study proposes a comprehensive online platform that provides tourists with up-to-date information about tourist spots, nearby facilities, and real-time weather conditions. The platform also streamlines the feedback and booking processes, offering a user-friendly experience for tourists and efficient management capabilities for administrators. The development of this system utilizes the MERN stack and Tailwind CSS to create a responsive and interactive interface. The results indicate that the proposed system enhances the overall tourism experience by providing accurate information, simplifying the booking process, and improving administrative efficiency.

Keywords: *Tourism planning, Online platform, Real-time updates, MERN stack, User-friendly interface, Administrative efficiency*

ICCI2025021: TEXT SUMMARIZATION AND TOPIC MODELING USING NLP TECHNIQUES

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ABSTRACT

Text summarization is a prevalent methodology for dealing with large amounts of information, as well as automatic summarization is an established approach for reducing a piece of paper to its main ideas. Since the amount of data on the web has multiplied over the past decade, a solution is needed that can transform this enormous quantity of useless raw data into information that a human brain can comprehend in the process of producing a concise, precise, fluid summary lengthy written document. Compare different algorithms for extractive summarization tasks, Text Rank, and Latent Semantic Analysis. Compare these algorithms for using Input Text. Text Rank, latent semantic analysis algorithms Performance Evaluation values Rouge Precision, Recall, scores are equal. It is also used for topic modeling methods such as Non-negative Matrix Factorization, Latent Dirichlet Allocation to swiftly recognize the primary concepts and concepts within an extensive amount of words and can assist viewers get an overview of what's important despite reading the entire work.

Keywords: Text Summarization, Latent Semantic Analysis, Latent Dirichlet Allocation, Topic Modeling, Non-negative Matrix Factorization

ICCI2025022: DATA-DRIVEN INSIGHTS AND AI SOLUTIONS FOR REDUCING STUDENT DROPOUTS: A COMPREHENSIVE ANALYSIS USING PREDICTIVE MODELLING

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ABSTRACT

India risks losing many of its future innovators and visionaries—the next APJ Abdul Kalam or Srinivasa Ramanujan—due to the high rate of student dropouts, particularly in rural and underserved areas. Economic and social difficulties, inferior academic achievement, and restricted access to educational resources are the main causes of these dropouts. At-risk students are frequently not identified early by traditional interventions, which results in a large amount of unrealized potential. The purpose of this study is to use data analytics and machine learning to analyze the main causes of student dropout rates. The study also suggests EduGuard, an AI-powered platform that identifies at-risk students and provides tailored, data-driven interventions in an effort to predict and lower dropout rates.

ASER, U-DISE+, and NGO reports are among the publicly accessible datasets used in the study. Descriptive statistics and correlation analysis were used to examine important variables, including family income, parental education, attendance, and academic achievement. Predictive models were created using random forest classifiers and logistic regression, and their accuracy, precision, and recall were assessed.

EduGuard's AI-powered early warning system detects students who are at risk, allowing for prompt interventions. Particularly in underprivileged areas, this strategy has the potential to significantly decrease dropout rates when paired with parental engagement resources and financial aid administration. For wider use, future studies will examine scalability and improvement.

Keywords: *Student Dropouts, Predictive Analytics, Machine Learning, AI Solutions, Educational Interventions, Early Warning System*

ICCI2025023: PREDICTIVE ANALYSIS OF ACADEMIC PERFORMANCE: IDENTIFYING INFLUENTIAL STUDENT FACTORS

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ABSTRACT

This study examines the effectiveness of various machine learning algorithms in predicting student performance and identifies the main factors influencing academic success. It explores which factors contribute to students' achievements and estimates their likely academic outcomes. By analyzing relevant data, we aimed to reveal both positive and negative influences on students' performance. Key positive factors included aspirations for higher education, parental education levels, disciplined study habits, participation in extracurricular activities, strong family bonds, internet access, and stable living conditions. In contrast, frequent social activities and romantic relationships were found to negatively impact academic performance. Among the algorithms tested, Logistic Regression achieved the highest accuracy at 73.10%. These findings offer valuable insights for educational institutions aiming to improve student outcomes through targeted, data-driven interventions.

Keywords: Machine-Learning, Student's Academic Performance, Education, Performance Prediction, Data mining, Classification Algorithm, Influential Factors.

ICCI2025024: CODE REVIEW PROMPT APPROACH FOR LOGICAL ERROR DETECTION

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ABSTRACT

Coding or Programming in general is a process which ensures theend result is always accurate, desirable and meets user requirements. The major setback for most of the programming systems (or applications) are hidden bugs and logical errors. The free code review prompts like Anakin, Taskade and Workik acts as an expert tool which validates, detects and provides a fix for the oversighted coding issues that are missed during development or struck in debugging to

identify the root cause of code failure. By providing code snippets to the prompts, the GPT-4's capabilities could be harnessed for most coding ventures. Debugging smaller portion of code is a finite approach to solve the errors in the programs. The code review prompts are best suited for applications that have huge LOC (Lines of Code) and built mostly but not limited to these programming languages (Third as well as Fourth Generation) such as: C, C++, Java, JavaScript, SQL, Python, Perl, PHP, Shell scripts...

Keywords: *code review prompt, logical error, context, bug, debug, GPT-4.*

ICCI2025025: GENETIC DISEASE PREDICTION AND OPTIMIZATION MODEL FOR PREDICTING GENETIC DISEASES IN CORPS

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ABSTRACT

The backbone of global food security is crops rich in carbohydrates, such as wheat, maize and rice, combined with protein sources like quinoa and lentils and oil crops such as canola and sunflower. However, these crops are increasingly vulnerable to genetic diseases that affect both yield and nutrient quality. To avoid losses in crops and there will be the sustainable production of wheat, maize, rice, quinoa, lentils, canola and sunflower in a manner that will have the disease resistance along with the high macronutrient yield, thereby ensuring food requirements in the future and the sustainability of agriculture. To propose a machine learning-driven Genetic Disease Prediction and Optimization Model (GDPM), which support selection, prediction and control genetic diseases on essential crops. GDPM concentrate on varieties that are resistant to rust or smut and also have a high starch or fiber content. To predict early detection of disease in the crop and help the breeders develop varieties with nutrient integrity even under stressed conditions like drought or pest attacks. Plant breeders, agricultural scientists and AI experts will have to collaborate for developing accurate models and ensuring practical adoption. The GDPM also enables farmers to know the data that is available currently, thereby allowing them to choose varieties that are resistant to such diseases.

Keywords: *Genetic Disease, Crop disease, Prediction, Optimization, Machine Learning*

ICCI2025026: CYBER EXPLOITATION ATTACKS ON INDUSTRIES: A REVIEW

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ABSTRACT

The expansion of technology has made drastic changes in the usage, access and reliability of man-power towards technology, but to rely we always look into the aspect of security. Security is a great concern in the world of technology. The field of cyber security plays a crucial role in such cases, where we require confidentiality and security. Cyber-attacks have been massively increasing daily and these are being expanded from targeting individuals to organizations leading to a greater loss. In this paper we are emphasizing on the key aspects related to cyber exploitation towards organizations to understand the motive, what types of attacks take place including tactics, techniques and procedures (TTP's), identify majorly targeted organizations by analyzing major events that have occurred during a particular period of time. This paper also aims to understand the strategies used to implement cyber-attack prevention methods for maintaining a secure cyber environment.

Keywords: *Information technology, Cyber-attack, Cyber Exploitations, Cyber security, Industries*

ICCI2025027: THE FUTURE OF STORY TELLING : AI AS A CREATIVE PARTNER IN LITERATURE

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ABSTRACT

This paper investigates the evolving role of artificial intelligence (AI) in creative writing education, examining its potential to enhance both the teaching and learning processes. We

explore the impact of specific AI writing tools, including ProWritingAid, INK, and NovelAI, on student creativity, engagement, and overall learning outcomes. Employing a mixed-methods approach, we combine quantitative data from surveys assessing student perceptions and experiences with qualitative data gathered through detailed case studies of individual students' interactions with the AI tools. Our findings reveal a complex relationship between AI and creative writing, showcasing both the benefits and challenges of integrating these technologies. While some students found the AI tools helpful for grammar and style improvement, others expressed concerns about potential over-reliance and the impact on originality. The study highlights the importance of thoughtful pedagogical approaches to integrating AI into creative writing programs, emphasizing the need for instructors to guide students in critically evaluating and utilizing AI tools to augment, rather than replace, their own creative processes. Ultimately, we argue that AI can be a valuable asset in creative writing education when implemented strategically, fostering a collaborative learning environment that empowers students to explore new possibilities while nurturing their unique creative voices. The implications of our findings extend beyond the specific tools examined, suggesting broader considerations for the responsible in

keywords: *Artificial Intelligence in Literature, Educational Impact of AI, Literary Creativity.*

ICCI2025028: CONTENT AWARE DYNAMIC SELF-ATTENTION MECHANISM AND SUSTAINABLE FEATURE PYRAMIDAL NETWORK FOR IMPROVING DEEP LEARNING BASED INSECT CLASSIFICATION

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ABSTRACT

Precise identification of insect species is essential for comprehending their ecological functions and effects. Conventional manual identification techniques are labor-intensive and necessitate taxonomic proficiency. Insects exist within interdependently connected biological and

ecological networks, where their taxonomy follows a structured hierarchy. The relationships between insect species are nonlinear, meaning that small morphological variations can significantly impact classification. This complexity makes deep learning an effective and advanced tool for capturing and modeling such intricate relationships. In this paper, the application of deep learning algorithms for taxonomic-level insect image classification is explored within the context of complex systems. Insects represent a highly interconnected biological network with nonlinear interactions. Recently, a VGG19 model outperformed other models in the fine-grained multi-class classification of insects at different levels like species, family, and order. However, intricate and disorganized backgrounds, including uneven lighting and reflections on insect images. can affect the model's accuracy. Therefore, this manuscript proposes the VGG19 with Enhanced GPACNet (VGG19-EGPACNet) model for fine-grained multi-class insect species classification. Initially, the VGG19 network processes the input insect images to capture feature maps, which it then passes to the EGPACNet model to enhance the feature representation. For this purpose, this EGPACNet includes a Sustainable Multilevel Feature Pyramid Network (SMFPN) and Bi-level Self-Attention (BSA) strategy instead of the typical Feature Pyramid Network (FPN) and Cross-Stage Trilinear Attention (CSTA) strategy. The SMFPN reduces the information discrepancy between Non-consecutive layers and minimizes the loss of relevant information during multilevel feature extractions. The Bi-level Self-Attention (BSA) mechanism enhances the model's capability to capture wide-range dependencies, thereby increasing content awareness. Then, the Fully Connected (FC) with Softmax is applied for the final classification of insects at different levels. Finally, experimental results on large-scale insect datasets validate the performance of this VGG19-EGPACNet model with an accuracy of 94.05%, 96.08%, and 96.14% at species, family, and order level classifications, respectively compared to the previous models.

ICCI2025029: CONTENT AWARE INTEGRATION OF A DUAL HYBRID DEEP CONVOLUTIONAL NEURAL NETWORK FRAMEWORK FOR INSECT TAXONOMIC CLASSIFICATION

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ABSTRACT

Insects constitute a vital element within numerous ecosystems, exerting significant influence on biodiversity, ecological dynamics, and the well-being of human health as well as natural resources.The taxonomic group "Insecta" stands out as one of the largest and most extensive within the realm of biodiversity taxonomy. Given their importance, sustainable management of insects, ecosystems, and their interrelationships is vital for the survival of all organisms. The novel approach for classifying insect images presented in this research is based on systematic taxonomic ranks at the order, family, and species levels and combining deep convolutional neural network models, termed as "Dual Hybrid Deep Convolutional Neural Network – DHDCNet Model". This model utilized a total of 6060 images for classification at the order level, 3740 images for the family level, and 1582 images for the species level. Various fine-tuned pre-trained DCNN models were employed to create the hybrid model. This study mainly aims to enhance the accuracy and efficiency of taxonomic level insect images classification and identification. Experimental results indicate promising outcomes. The proposed DHDCNet model achieved an accuracy of 98.97% at the order level, 97.37% at the family level, and 89% at the species level, across five different classes of insects. The effectiveness of the model was thoroughly assessed using various performance metrics, including precision, recall, and F1-score, offering a detailed understanding of its performance across multiple evaluation criteria.

Keywords: *Insect classification and identification, Data Augmentation, Pre-Trained Models, Deep Convolutional Neural Networks (DCNN), Deep Learning, Hybrid Method, Dual Hybrid Deep Convolutional Neural Network.*

ICCI2025030: CHALLENGES AND OPPORTUNITIES OF AI IN HUMAN RESOURCE MANAGEMENT AMID THE RAPID EVOLUTION OF CONTEMPORARY WORK ENVIRONMENTS

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ABSTRACT

Artificial Intelligence , has become an integral aspect of contemporary life, advancing rapidly and potentially reshaping the landscape of tomorrow's human resources. This research paper explores the impact of AI on future employment opportunities, investigating its role in facilitating human resources across diverse sectors and streamlining tasks for increased efficiency and precision. Artificial Intelligence (AI) holds significant potential in enhancing talent management strategies through the implementation of advanced automated systems for workforce management. The advent of AI has proven instrumental, particularly during crises such as the COVID-19 pandemic, where machines played a pivotal role in expediting tasks and saving lives without being susceptible to the virus. While AI presents numerous advantages, it challenges the traditional work landscape by reducing human involvement. The future trajectory of talent management is closely intertwined with the continuous evolution of intelligent technologies and the rapid expansion of computer capabilities. Implementing AI necessitates comprehensive changes in the entire organizational framework. This involves a shift in the organizational culture, necessitating employee training in alignment with the latest AI systems and the adoption of new management methodologies. Such changes will inevitably reshape the way people approach and execute their work.The integration of AI into the workplace has broader implications, including the rise in globalization and the growing diversity of the domestic workforce. These factors will significantly influence human resource practices in the era of AI.While AI proves instrumental in enhancing human productivity, it concurrently poses challenges. For instance, the shift from a manufacturing-centric to a service or knowledge-based economy triggered by AI can significantly impact human resources. This study aims to discern the effects of AI on human resources and job opportunities in the forthcoming years.To achieve this, a comprehensive approach was adopted, encompassing both qualitative and quantitative research methodologies. Data were collected through random sampling, incorporating research papers and quantitative analyses. This study aims to provide a subtle understanding of AI's role in human resource management, elucidating the challenges encountered by humans in the workforce due to AI and the opportunities it presents to streamline tasks. In essence, this paper discusses the challenges precipitated by AI in the

workplace and concurrently highlights the opportunities it affords for simplifying work processes. In conclusion, while AI promises transformative benefits for talent management, its implementation requires a proactive approach to address the ensuing challenges and ensure a seamless transition into the future of work.

ICCI2025031: SECURE BALLOT: A CRYPTOGRAPHICALLY AUTHENTICATED VOTING SYSTEM FOR SMBS

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ABSTRACT

In the realm of decision-making where consensus or majority agreement is sought while preserving the confidentiality and integrity of opinions, crypto voting emerges as an indispensable tool. Particularly beneficial for small to medium sized Business (SMBs), where this system operates on the principle of anonymity for voters and confidentiality of their choices, bolstering the process of distributed consensus. However, implementing such a system within distributed environments poses multifaceted challenges, including ensuring majority voting, fault tolerance, performance optimization, vulnerability mitigation, and addressing security and privacy concerns. To mitigate these hurdles, the article proposes a implementation that relies on Ranked-choice Voting, utilizing the Damgard-Jurik cryptosystem, a threshold cryptosystem that distributes trust among multiple election authorities. Central to this endeavour is the imperative to safeguard the privacy of participants and their decisions, recognizing the potential influence of various factors such as interpersonal relationships or external pressures on voting outcomes. The core objective of this system is to facilitate authentic voting experiences characterized by simplicity, security, confidentiality, and fairness. Establishing a balanced voting mechanism can help Business and institutions effectively identify collective opinions, foster consensus within distributed systems, and uphold the

principles of integrity and authenticity.

ICCI2025032: CLASSIC MODELS, MODERN THREATS: A STUDY ON ADVERSARIAL ATTACK AND DEFENSE FOR TRADITIONAL ML MODELS

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ABSTRACT

Adversarial attacks have appeared as one of the significant challenges to machine learning, for both traditional architectures like neural networks and advanced architectures including vision transformers (ViTs). While major efforts have targeted defending state-of-the-art deep learning models against attacks like Fast Gradient Sign Method (FGSM), Projected Gradient Descent (PGD), and Gaussian noise perturbations, traditional models like logistic regression, SVMs, and decision trees remain somewhat understudied, although they are widely applied when computational complexity and interpretability are necessary. This work systematically examines the adversarial susceptibility of these models using the MNIST dataset and tests a few different defense mechanisms, including adversarial training, input pre-processing (Gaussian smoothing), and defensive distillation. The results of this paper demonstrate that adversarial training significantly outperformed the other defenses, where accuracies rose to 95% across all attack scenarios. Input preprocessing and defensive distillation achieve mediocre effectiveness, reporting accuracies of 18%-57% across different attack settings. This paper greatly extends adversarial threat analyses to traditional machine learning models and makes it clear that those models are inherently vulnerable and introduces actionable strategies for defense. These results highlight the significance of appropriate security provisions and,

at the same time, reaffirm practical applicability of traditional models to resource-limited environments and thus support a more holistic understanding of adversarial defense in the entire spectrum of machine learning.

ICCI2025033: CRYPTOQUERY: SECURE DATABASE ENCRYPTION AND QUERYING FRAMEWORK

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ABSTRACT

As databases have become a prevalent medium for storing information, attacks targeting these systems to steal sensitive data have also increased, necessitating robust countermeasures. This paper introduces CryptoQuery, a secure database encryption and querying framework that implements higher-level, or record-level encryption to protect sensitive data stored within the database. Central to the framework is an indexing module that enables efficient querying of encrypted records without compromising security. The development process includes database design, creation of an indexing algorithm, query algorithm development, and web application deployment. CryptoQuery leverages a row encryption approach to enhance data protection in the field of cybersecurity.

Keywords: *Databases, Cryptography, Encryption., Storage, Database Management System (DBMS).*

ICCI2025034: DYNAMIC SPECTRUM ALLOCATION FOR VEHICULAR AD HOC NETWORKS: A MACHINE LEARNING APPROACH

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ABSTRACT

Vehicular Ad Hoc Networks (VANETs) play a vital role in intelligent transportation systems by facilitating vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication to improve road safety and traffic efficiency. The unpredictable nature of VANETs poses challenges for spectrum allocation, impacting communication reliability and network performance. This paper introduces a new method for dynamic spectrum allocation in VANETs utilizing machine learning technologies, such as Support Vector Machines (SVM) and Reinforcement Learning (RL) algorithms. SVM is utilized to forecast traffic patterns and network conditions based on past data. Our method uses Reinforcement Learning (RL) to dynamically allocate spectrum in a timely manner. By studying past data and environmental conditions, we enhance spectrum allocation to reduce interference and boost communication stability. Through thorough simulations, we compare our method with conventional static spectrum allocation techniques. The outcomes reveal that our AI-powered approach greatly enhances network capacity, reduces latency, and maximizes spectrum usage. This makes it a viable option for enhancing the effectiveness and dependability of VANET communication systems.

Keywords: VANETs, Dynamic spectrum allocation, Machine learning, Support Vector Machines (SVM), Reinforcement Learning (RL), Traffic patterns

ICCI2025035: PREDICTIVE ANALYTICS FOR CARDIOVASCULAR DISEASE RISK USING ELECTRONIC HEALTH RECORDS (EHRS)

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ABSTRACT

The primary cause of death worldwide is cardiovascular diseases (CVDs), necessitating effective strategies for early detection and intervention. Predictive analytics, leveraging machine learning (ML) techniques and the vast data reservoirs available through Electronic Health Records (EHRs), offers significant promise in assessing CVD risk with high accuracy. This paper explores the application of predictive analytics in CVD risk assessment using EHR data, emphasizing the techniques for feature selection, model training, data preparation, and evaluation. The best models for this problem are determined by comparing a number of machine learning algorithms, such as Random Forest, Support Vector Machines (SVM), Logistic Regression, Neural Networks, and Gradient Boosting Machines (GBM).Additionally, the study addresses challenges such as data privacy, class imbalance, model interpretability, and bias mitigation, proposing strategies to overcome these hurdles. The results demonstrate how ML-driven prediction models can improve clinical judgment, optimize the utilization of healthcare resources and improve patient outcomes. The study underscores the importance of integrating these tools into clinical workflows while maintaining ethical standards and ensuring model transparency

Keywords: Predictive Analytics, Cardiovascular Disease, Electronic Health Records, Machine Learning, Risk Assessment, Data Preprocessing, Model Interpretability, SHAP, Random Forest, Gradient Boosting, XGBoost, Imbalanced Data, Feature Selection, Clinical Decision Support, Privacy, Bias Mitigation.

ICCI2025036: A COMPREHENSIVE SURVEY ON CLASSIFICATION METHODOLOGIES USING MACHINE LEARNING FOR IDENTIFYING ANIMALS AND THEIR SPECIES

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ABSTRACT

Animal species identification using machine learning is an innovative approach that leverages computational techniques to recognize and classify different animal species from various forms of data. This technology is transforming fields such as wildlife conservation, ecological research etc., Images, audio, and other types of data can be used to train machine learning (ML) models to identify different species of animals. These algorithms enable automated and precise identification by learning from vast datasets to identify patterns and characteristics particular to each species.Identification of animals using machine learning serves several important purposes across various domains, including research, conservation and management. It is useful for estimating the population of animals accurately with the help of automated identification that supports wildlife management decisions, such as establishing protected areas or setting harvest quotas. Individually identifying animals or species that conflict with human populations helps in implementing effective mitigation strategies. Machine learning enables continuous, real-time monitoring of animal populations and behaviors, which is more efficient and scalable compared to manual and hybrid methods. Automated identification reduces the time and cost associated in this process, which eases the ways of collecting and analyzing large datasets more effectively. On the whole, the purpose of identifying animals using machine learning is to enhance the understanding of wildlife, facilitate conservation efforts, and support sustainable management practices that help in ensuring the long-term survival of species and ecosystems.

Keywords: *Animal classification, Machine Learning, Deep Learning, Automatic classification of Animals*

ICCI2025037: A POSITION ALIGNED MODEL CLASS ATTENTION BASED BIRD SPECIES

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ABSTRACT

Early detection of declining bird species enables timely intervention for their protection and conservation measures to preserve crucial habitats. Various Deep Learning (DL) methods have been developed for the bird species identification. The feature inconsistency issues caused by the changes of object pose or viewing angle in the captured bird images. To solve this, unsupervised Part-to-Pose Network (P2P-Net) is developed to resolve the above-mentioned issues. This P2P-Net captures the bird body parts and object poses to regularize the representation learning with no additional annotations of part position or pose information. P2P-Net confidently differentiates the class-discriminative regions from region proposals by FPN. In order to incorporate the fine-grained appearance on certain parts, the global object representation is regularized with local representations of detected salient regions by lowering the distribution difference with the contrastive loss. But, the top discriminative parts identified using a P2P have found to be inconsistently configured and it is not strictly aligned. To match the discriminated regions, Graph Matching Algorithm (GMA) takes edge (relationship) similarity is considered. The permutation with the max matching degree is selected as the correct order and the algorithm returns the resorted parts representations. The complete model is termed as Position Aligned Enhanced Class Attention based Deep Bird species detection network (PA-ECADepBnet). method reduces feature inconsistencies in bird images by adjusting object posture and viewing angle, thereby improving the accuracy of bird species prediction. Finally, the experimental results revealed that the proposed model achieves 97.63% accuracy on Indian-Birds-Species-Image-Classification dataset than other existing models.

Keywords: Deep Learning, Graph Matching Algorithm, Fine-Grained Appearance

ICCI2025038: TAMHNET: OPTIMIZED INCEPTION-BASED NEURAL NETWORKS FOR HANDWRITTEN CHARACTER RECOGNITION

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ABSTRACT

Character recognition for a multitude of languages, including Telugu, Malayalam, Chinese, and Devanagari is a current area of research. The work of Tamil Handwritten Character Recognition (THCR) is highly challenging as different people write in various ways. To address this we proposed Deep Inception Neural Network (DINN) for effective handwritten character recognition in Tamil. Our own Tamil Isolated Character Dataset (TICD) is used to train the proposed framework from inception. The handwritten images are preprocessed using a non-linear bilateral filter approach, and the Tamil handwritten characters are classified using a Deep Dense Inception Neural network. The intent of an Adam optimiser is to increase recognition efficiency, optimise the weights, and improve image quality. This effective Deep Dense Inception Neural framework with Transfer Learning (TL) outperformed other cutting-edge algorithms, achieving an impressive accuracy of 99.8%. This framework's main goal is to identify old texts, including copper plates, palm leaves and inscriptions.

Keywords: Deep Inception Neural Networks (DINN), Adam classifier, Tamil Handwritten Character Recognition (THCR), Tamil Isolated Character Dataset (TICD), deep neural framework, Transfer Learning (TL).

ICCI2025039: DEEP FUSED HYPER GRAPH CONVOLUTION NEURAL ARCHITECTURE FOR LUNG CANCER TISSUE SUBTYPING

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ABSTRACT

Lung cancer is widely recognized as one of the most life-threatening malignancies. Histopathological diagnosis through visual inspection of tissue slides demands extensive

examination time and relies on the physician's subjective judgment. Accurate subtyping of histopathological images is crucial for effective treatment strategies. However, prevailing models encounter complexity and a heavy reliance on pathologist annotations, leading to high computational demands and long processing times. A novel deep fused Hyper Graph convolution neural architecture (HGNet) is proposed for accurately subtyping lung cancer tissues. The deep features are extracted using a Pairwise Separable Kernel-based Convolutional Neural Network (PSK-CNN), and the dimensionality reduction of the features is done using Adaptive Channel Response Recalibration. The k-dimensional Hypergraph Convolutional Neural Network(k-HCNN) is designed to classify the extracted deep features efficiently. The model adopts Heterogeneous representation learning to effectively fuse the higher-order relationships using the Hyperedge Group Fusion (HGF) strategy. The proposed model achieves an ideal holdout validation accuracy of 99.93%, as demonstrated in the experimental results. The model's overall precision, recall, score, and specificity are 99.89%, 99%, 98.90%, and 99.94%, respectively, outperforming other state of art algorithms. HGNet helps pathologists and medical practitioners in differentiating lung cancer subtypes enabling targeted treatment and facilitate effective disease management.

Keywords: Deep fused Hyper Graph convolution neural architecture, Pairwise Separable Kernel-based Convolutional Neural Network (PSK-CNN), k-dimensional Hypergraph Convolutional Neural Network (k-HCNN), Adaptive Channel Response Recalibration (ACRR), Heterogeneous Representation Learning (HRL), Hyperedge Group Fusion (HGF).

ICCI2025040: LEVERAGING MACHINE LEARNING MODELS FOR DIABETES PREDICTION

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ABSTRACT

Diabetes is one of the most deadly health conditions mankind faces today, with millions being affected by it worldwide, This is where early detection can significantly reduce complications and save lives. This study evaluates the predictive capabilities of several popular machine learning algorithms K-Nearest Neighbors (KNN), Decision Trees, Random Forests, and Logistic Regression for diabetes diagnosis. A thorough literature review establishes the

groundwork, followed by model implementation and a comparative analysis of their accuracy and performance. The results reveal that Logistic Regression achieves the highest accuracy at 88%, demonstrating machine learning's potentialin proactive healthcare diagnostics and early intervention strategies.

Keywords: Machine Learning, Diabetes, KNN, Decision Tree, Random Forests, Logistic Regression, Intervention Strategies, Comparative Analysis

ICCI2025041: IDENTIFICATION OF KEY BIOMARKERS IMPACTING THE PREDICTION OF HEART DISEASE USING ARTIFICIAL NEURAL NETWORKS AND MODEL INTERPRETABILITY WITH SHAP

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ABSTRACT

Heart disease and the risk of heart attack have increased recently. Prognosing heart illness is difficult for doctors. Computer-assisted diagnosis research is persistent and growing. Computer-assisted diagnostics uses AI extensively. AI could provide elegant and automated methods for the study of high-dimensional, multimodal biological data used by biomedical experts to diagnose and understand disease. The study uses an Artificial Neural Network (ANN) to forecast a patient's likelihood of having coronary heart disease. A few of the performance indicators have been used to evaluate the prediction model. As AI grows more significant in healthcare, concerns about its explainability, transparency, and model bias are growing. This makes Explainable Artificial Intelligence (XAI) relevant. XAI promotes the adoption of AI in healthcare by increasing the confidence of medical practitioners and AI researchers in an AI system. This work describes the application of Explainable AI (SHapley Additive exPlanations - SHAP) to find informative features and their interpretations from the ANN model used for predicting coronary heart disease. The ANN model has given extremely good performance with an accuracy of 0.99, AUC of 1.0 and recall of 1.0 which means that all

the patients having heart disease were predicted positive. The model when interpreted using SHAP, clearly shows the significance of each feature and their influence in predicting the presence of heart disease in a person. Also, while interpreting the prediction for an individual, the plots show based on which of the features the person has been predicted as a positive or negative case.

ICCI2025042: CUTTING-EDGE DEEP LEARNING MODELS FOR SKIN LESION DIAGNOSIS AND CATEGORIZATION

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ABSTRACT

One of the most common kinds of cancer in the world, skin cancer highlights the critical requirement for sophisticated, scalable, and accurate detection tools. By applying the International Skin Imaging Collaboration dataset, a vast collection of annotated dermoscopic visuals, this study presents a novel method for skin lesion diagnosis and classification by utilizing cutting-edge deep learning techniques. Using EfficientNet, a highly optimized neural network architecture, for extracting and categorizing features, the proposed approach takes use of its ability to strike a balance between accuracy and computational economy. Data augmentation is performed using adaptive augmentation techniques, including geometric transformations and intensity scaling, to enhance the diversity of training data. A graph-based segmentation method is employed to delineate lesion boundaries, facilitating the extraction of precise features. For feature enhancement, wavelet-based texture analysis is combined with deep features to improve diagnostic performance. The proposed model, EffiWave-Net, combines EfficientNet for efficient feature extraction with wavelet-based texture analysis, achieving advanced performance in skin lesion diagnosis and categorization. With an accuracy of 94.1%, preciseness, which of 0.96, recall, which of 0.94, and F^1 score, which of 0.95, the model outperforms current techniques and achieves impressive performance. The integration of EfficientNet with advanced feature representation techniques highlights the effectiveness of

this approach in addressing challenges such as inter-class variability and data imbalance. This study illustrates the transformative potential of combining cutting-edge architectures and innovative preprocessing techniques in skin lesion diagnostics.

Keywords: Skin Lesion Diagnosis, Deep Learning, EfficientNet, Dermatological Image Analysis, Wavelet-Based Analysis of Texture, Adaptive Data Augmentation.

ICCI2025043: COMPARISON OF EXISTING MACHINE LEARNING ALGORITHMS WITH PROPOSED HYBRID ENSEMBLE GRADIENT BOOSTING TECHNIQUE IN REGARDS OF DIABETES PREDICTIONEP LEARNING MODELS FOR SKIN LESION DIAGNOSIS AND CATEGORIZATION

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ABSTRACT

Diabetes is a chronic disease marked by elevated blood sugar levels that can seriously harm the kidneys, heart, eyes, brain, and renal system, among other organs. A range of data analysis methods are used in healthcare analytics to enhance patient care. In order to predict the illness as soon as possible and avoid it, a machine learning model was constructed using a variety of machine learning techniques. The research effort focuses on the 770 diabetic people living in the Andaman and Nicobar Islands. In order to preprocess the data for this study, the gathered dataset was divided into training and testing sets using exploratory data analysis approaches. The research then used feature engineering techniques to determine the importance of each characteristic and produce a precise diabetes mellitus prediction based on the risk factor determined by the Indian Diabetes Risk Score (IDRS). The model used in the current research work uses nine machine learning algorithms to produce accuracy, precision, recall, and f[1] score: the Gaussian Naïve Bayes algorithms, Ada Boosting classifier, XG Boosting classifier, Random Forest classifier, Bagging classifier, Logistic Regression, Linear SVC Algorithm,

KNN classifier, and decision trees algorithm. Based on the results, it was determined that the Gaussian Naïve Bayes technique, Decision Trees, Logistic Regression, Ada Boosting, XG Boosting, KNN, and Random Forest classifiers gave the best accuracy of 88%. The study then developed a hybrid ensemble gradient boosting technique and used it on the suggested system, producing the best outcomes in terms of ROC curve (87%), accuracy (99%), precision (79%), recall (84%), and AUC (87%). Thus, it can be concluded that the suggested hybrid ensemble gradient boosting classifier not only outperforms the other machine learning techniques and yields better results, but it also accurately predicts patients' chance of acquiring diabetes mellitus based on risk factors.

Keywords: *Accuracy, AUC, Cross Validation Score, Diabetes Mellitus, F[1] Score, Hybrid Gradient Boosting Algorithm, Precision, Recall and ROC Curve*

ICCI2025044: DISCOVERY OF PROFITABLE ITEMSETS FROM NORMALIZED DATABASES : AN INTELLIGENT DECISION SYSTEM

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ABSTRACT

High-utility itemset mining has become a significant field in recent years in the field of business making. Majority of the algorithms fail to function for itemsets with negative utility. Our suggested effort focuses on the two problems mentioned above. This unique algorithm Efficient Discovery of Profitable Itemsets with Negative Items (EDPI-NI) has been suggested to locate entire list of high utility itemsets with or without negative utilities. To more effectively find high-utility itemsets, the algorithm includes a number of fresh concepts. To more efficiently trim the search space, EDPI-NI algorithm uses two new upper-bounds called refined sub-tree utility and local utility. An array based utility counting technique is used to compute these upper bounds in linear time and space. Additionally, EDPI-NI suggests effective database projection (EDP), early transaction merging (ETM),

similarity merging (SM) and removal of short transactions (RST). All these reduction techniques are executed in linear time, to lower the cost of database scans. An extensive research on numerous datasets reveals that the algorithm EDPI-NI performs well on sparse datasets and is two to three orders of magnitude quicker than state-of-the-art algorithms on dense datasets. EDPI-NI algorithm also uses less memory. The outcomes thus demonstrate that our algorithm operates more effectively.

Keywords: *Fast-utility counting, High-utility database merging and projection, High-utility mining, Negative mining*

ICCI2025045: SOLNIX - SOLAR POWERED WATER SURFACE CLEANING ROBOT

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ABSTRACT

Marine pollution poses significant threats to aquatic ecosystems, increasing the risk of infectious diseases and environmental degradation. To address this issue, this work presents the design of Solnix, a lightweight, solar-powered surface-mounted waste collection robot. The robot uses lightweight solar panels for propulsion energy, enabling autonomous operation without external power. It is equipped with an Arduino Uno, L298N motor driver, HC-05 Bluetooth module, two 3.7V DC motors, a GPS system, and a camera for monitoring and navigation. The GPS system allows the robot to return to its origin point, while the camera captures images to detect and collect floating waste. A solar panel charges a 3.7V battery, powering the motors efficiently. Additionally, a weed tank releases water-purifying agents to enhance river water quality. This system effectively cleans water surfaces, supporting environmental sustainability in rivers, lakes, and seas. The proposed design offers a cost-effective and energy-efficient solution to tackle floating waste and improve environmental quality.

Keywords*—Solnix, Water Purification, GPS Navigation, Propulsion, Travelator, three-dimensional design.*

ICCI2025046: EXAMINATION QUESTIONS CLASSIFICATION USING OPTIMIZED HYPER OPTUNALGBM CLASSIFIER BASED ON REVISED BLOOM'S TAXONOMY

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ABSTRACT

In academic institutions, written exams are the most conventional and traditional method of evaluating students. The need to assess test question quality and students' cognitive abilities has been highlighted by educational advancements. On the other hand, the professor finds the process of creating questions to be quite difficult. Attempts by lecturers to provide fair and high-quality questions to evaluate students at varying cognitive levels are becoming increasingly difficult. High-quality tests are written, assessed, and measured using Revised Bloom's Taxonomy (RBT), which is extensively utilized in the educational setting. As a result, numerous scholars have worked on automating the RBT based grouping of test questions. This study suggested using the OPTUNA Hyperparameter Optimization Framework to automatically categorize exam questions based on RBT's cognitive levels. In order to categorize exam questions according to the cognitive domain, which encompasses application, knowledge, understanding, analysis, synthesis and evaluation levels, the research work suggested an improved Light Gradient Boosting Machine (LGBM) classifier. Data pre-processing is first applied to an online real-time dataset prior to the feature extraction and classification stages. Based on Term Frequency Inverse Document Frequency (TF-IDF), the Feature Extraction (FE) is performed. In order to categorize the test questions and choose a reasonable weight for the vital words in the question, the FE is to compute and identify the main features from the raw data based on part of speech. With a 95.3% accuracy rate, the proposed hyperOPTUNALGBM classifier outperformed than the other Machine Learning (ML) models.

Keywords: *Revised Blooms Taxonomy (RBT), hyperOPTUNALGBM, exam questions, cognitive, classifying, optimization*

ICCI2025047: INNOVATIVE FRAMEWORK FOR ASSESSING DATA MINING METHODS

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ABSTRACT

This paper aims to introduce a novel perspective for evaluating various techniques used to address data mining tasks. These tasks encompass key methodologies such as Statistics, Visualization, Clustering, Decision Trees, Association Rules, and Neural Networks. The proposed approach successfully establishes new criteria for the evaluation process, offering a comprehensive framework for assessing the effectiveness and applicability of each technique. It emphasizes critical aspects, including the nature of the technique, the operational environment in which it is applied, and the advantages and disadvantages associated with each method. Moreover, the paper explores the implications of selecting specific techniques for extracting meaningful and predictive insights from extensive databases. It also delves into the implementation methodologies unique to each technique, providing a holistic understanding of their utility and impact. Finally, the study concludes by offering practical and insightful recommendations that aim to enhance the evaluation and application of data mining techniques in various domains.

Keywords: Data Mining Evaluation,Statistics, Visualization, Clustering, Decision Trees, Association Rules, Neural Networks.

ICCI2025048: AN INVESTIGATION ON THE DETECTION AND CLASSIFICATION OF SKIN CANCER USING DEEP LEARNING

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ABSTRACT

The defining feature of cancer is the unregulated growth of atypical cells, which can potentially spread to other organs or tissues. Skin cancer ranks among the most deadly and harmful forms of cancer. Fortunately, early detection allows for effective treatment of skin cancer. The

effectiveness of treatment and the survival rates of patients hinge on timely and accurate diagnosis. The assessment of skin lesions by dermatologists can often be influenced by personal interpretation, leading to potential inaccuracies that may result in diagnostic delays or unnecessary procedures. Recent developments in machine learning and deep learning have empowered medical professionals to detect skin cancer earlier and with greater accuracy, ultimately reducing costs for patients and preventing expensive diagnostic procedures. Convolutional neural networks (CNNs) and various deep learning algorithms are widely employed in the detection and classification of skin cancer, although hybrid methods and machine learning techniques also play a role. These techniques demonstrate significant potential for the early detection of skin lesions, as they serve as highly effective classifiers. This study examined various techniques for identifying skin cancer. Techniques from Machine Learning and Deep Learning are included in the strategies. Our examination of skin cancer detection techniques also encompassed an analysis of transfer learning and hybrid methodologies.

Keyword: skincancerdetection,DeepLearning,MachineLearning,TransferLearning.

ICCI2025049: EFFECTS OF SCREEN TIME ON CHILDREN'S COGNITIVE DEVELOPMENT

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ABSTRACT

Screen time for early childhood is recently considered to be one of the major problems regarding cognition, socialization, and emotional development. Generally, educational applications enhance the creative skills and ability to learn. This study, however has focused on excessive use of screens especially in cases where children tend to indulge in mere video viewing and exploring certain types of social network media. This is linked with sleep deprivation, lesser interaction, and psychological issues like anxiety and stress. This paper explores how screen time influences children's sleep, mental health, and well-being using the "Mental Health and Screen Time Correlation" dataset. The dataset includes screen time data, app usage data, including entertainment and social media, sleep duration, and mental health

indicators like mood ratings, stress, and wellness scores. With the exploratory data analysis done, increased screen time was also associated with short sleep, lower wellness scores, and high levels of stress. The experimental analysis provides an inverse relation between the amount of time used for screen, the amount of quality sleep obtained by a user and demonstrates that most individuals used the screen for entertaining activities. From the above results, we suggest parents should avoid too much passive screen use; encourage educational or creative use of screens; and combine this with lots of physical activity while keeping responsibility on app use for which mindful management of screen use would be crucial to healthy cognitive and emotional development. Nutritious foods and creative activities promote growth, focus, and balanced development while reducing screen time, with parents and teachers supporting this through encouragement, active play, and no-screen zones.

Keywords: *Screen time, cognitive development, screen exposure, parental control, active screen engagement, healthy screen habits.*

ICCI2025050: TRANSFORMING TELECOM SALES FORECASTING: LEVERAGING AI, MACHINE LEARNING, AND STATISTICAL TOOLS

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ABSTRACT

Accurate sales forecasting is very essential for products like starter- packs in the telecom industry. This helps in meeting customer demand and optimizing the inventory. In the market environment which is very volatile, the challenge of forecasting sales for starter-packs has been addressed, leveraging machine learning, deep – learning, and statistical algorithms alongside advanced feature engineering techniques. The choice of right algorithm plays a key role in determining the final results. Hence, a structured methodology is proposed for the choice of algorithms. The temporal data from January 2020-June 2024 has been procured from one of the leading IT Industry's client and best model has been prioritised and validated with

forecasting data from Jan 2024 to June 24. Finally, it is evident that by leveraging advanced feature engineering techniques, choosing the right kind of algorithm and optimizing the models, Machine learning and statistical algorithms like SARIMAX, Multiple Linear Regression (MLR) and Random Forest Regressor (RFR) can perform better as compared to the deep-learning algorithms. SARIMAX is performing better in the regions CJWJ, EJBIN, and at National level with the test MAPE 0.05, 0.09 and 0.04 respectively. For the Regions JABOTABEK and KALISUMAPPA, Random Forest Regressor is performing better with the test MAPE being 0.07 and 0.0[1] respectively. And for the region SUMATERA, Multiple Linear Regression model is giving the best accuracy with test MAPE 0.11.

Keywords: *Sales Forecasting, RNN, LSTM, GRU, SARIMAX, ARIMA, Machine learning, Deep Learning, Telecom, ABC analysis*

ICCI2025051: UNVEILING THE ETHICS OF DATA SCRAPING PRESERVATION: BALANCING ACCESS AND PRIVACY

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ABSTRACT

In today's digital landscape, the widespread prevalence of data scraping poses profound challenges to privacy, security, and data integrity. This paper proposes an integrated methodology aimed at proactively thwarting data scraping attempts while upholding ethical principles and legal standards. Our approach combines technological innovations, legal frameworks, and ethical considerations to address the multifaceted complexities surrounding unauthorized data scraping activities. Data scraping, which involves the automated extraction of data from websites, has emerged as a prevalent practice across diverse domains, eliciting concerns regarding privacy infringements, security breaches, and intellectual property violations. To combat these challenges, our methodology offers a comprehensive framework for preventing and mitigating the risks associated with data scraping. We begin by examining the technical dimensions of data scraping prevention, including the implementation of captcha systems, IP blocking measures, and dynamic content rendering techniques to deter automated

scraping bots. These technological solutions serve as crucial deterrents, disrupting scraping operations and dissuading malicious actors from extracting data without authorization. Furthermore, we delve into the legal and regulatory mechanisms that provide deterrents against data scraping activities. This encompasses leveraging terms of service agreements, copyright laws, and data protection regulations to establish clear boundaries and legal recourse for individuals and organizations affected by data scraping incidents. By enforcing these legal frameworks, we strive to create a robust legal deterrent against unauthorized data scraping and hold perpetrators accountable for their actions. Moreover, our methodology emphasizes the ethical dimensions of data scraping prevention, emphasizing principles such as transparency, consent, and fairness in data collection practices. We advocate for responsible data handling practices that respect user privacy rights and uphold ethical standards in the digital realm..

Keywords: Data scraping, Security, Ethical principles, IP blocking, Cookies.

ICCI2025052: DEEP LEARNING TECHNIQUES FOR LESION SEGMENTATION ON POST-STROKE MRI BRAIN IMAGING DATA: A REVIEW

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ABSTRACT

Stroke is a major worldwide health concern, and proper diagnosis, treatment planning, and tracking of the course of neurological diseases depend on the precise segmentation of brain lesions. However, attaining high segmentation accuracy is hampered by the intricacy of lesion features in Magnetic Resonance Imaging (MRI) scans. Addressing these challenges is critical for improving the accuracy and reliability of stroke diagnosis.

The effectiveness of deep learning in improving lesion segmentation accuracy in post-stroke MRI imaging is assessed in this review. It emphasizes the application of neural network architectures designed to specifically handle the difficulties associated with imaging strokes, such as convolutional neural networks (CNNs), U-Net and Transformer-based models. From the use of sophisticated algorithms to the clinical difficulties in treating strokes, the development of deep learning in this field is examined. The review also explores key datasets,

including Ischemic Stroke Lesion Segmentation (ISLES) and Anatomical Tracings of Lesions After Stroke (ATLAS), which are instrumental in training and validating these models.

The review's conclusion outlines key challenges and possible directions for further research, emphasizing the need for methods that increase segmentation accuracy while accelerating their use in clinical practice. In addition to improving segmentation accuracy, these developments are expected to promote the incorporation of state-of-the-art technologies into standard clinical procedures, guaranteeing better treatment and results for stroke survivors.

Keywords: *Brain Imaging, Deep Learning, Lesion Segmentation, Neurological Diseases, Stroke*

ICCI2025053: EXPLORING THE ROLE OF BRAIN-COMPUTER INTERFACES IN ENHANCING EDUCATION AND COGNITIVE TRAINING

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ABSTRACT

Brain-Computer Interfaces (BCIs) have emerged as a revolutionary technology that enables direct communication between the brain and external devices, offering immense potential for education and cognitive rehabilitation. This paper investigates how BCIs can be applied in educational settings and cognitive training, aiming to improve learning processes and cognitive functions. Advances in non-invasive BCI methods, such as electroencephalography (EEG) and functional near-infrared spectroscopy (fNIRS), have demonstrated effectiveness in enhancing attention, memory, and problem-solving skills. BCIs are increasingly used for personalized learning experiences and real-time feedback systems, which optimize student engagement and knowledge retention. Moreover, the role of BCIs in neurofeedback therapy for individuals with cognitive impairments, including traumatic brain injuries and neurodegenerative diseases, is discussed. Through an extensive review of literature, case studies, and real-world applications, this study highlights the challenges of signal accuracy, user comfort, ethical considerations, and data privacy. Ultimately, it underscores the need for interdisciplinary collaboration to refine BCI applications in education and cognitive training.

Keywords: *Brain-Computer Interface, Education, Cognitive Training, Neurofeedback, Cognitive Rehabilitation, BCA, Artificial Intelligence, Neurotechnology, Learning Enhancement*

ICCI2025054: A COMPARATIVE STUDY OF ANOMALY DETECTION ALGORITHMS IN MEDICAL IOT ENVIRONMENTS

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ABSTRACT

Through the networking of medical equipment, the Internet of Things (IoT) has revolutionized healthcare by facilitating data sharing and ongoing monitoring. But because of the serious security threats that come with this connectivity, reliable anomaly detection is crucial to preserving patient safety and data integrity. Using a synthetic dataset that mimics real-world circumstances, this study compares several anomaly detection algorithms created especially for medical IoT applications. We assess the effectiveness of many strategies, with an emphasis on scalability, accuracy, and efficiency. These strategies include deep learning techniques, machine learning algorithms, and statistical methodologies. We determine the advantages and disadvantages of each strategy in identifying abnormalities pertaining to patient data and device behaviour by examining the outcomes. Our research should help academics and practitioners choose appropriate anomaly detection techniques that will improve the security and dependability of medical IoT systems.

Keywords: Internet of Things, security threats, anomaly detection, data integrity, synthetic dataset, medical IoT applications, deep learning techniques, machine learning algorithms, statistical methodologies.

ICCI2025055: ENHANCING PLAGIARISM DETECTION ACCURACY WITH ENSEMBLE MODELS: A STUDY OF LINEAR REGRESSION AND SVM

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ABSTRACT

Plagiarism detection is an essential part of the area of generative content where AI generated text is posing an unprecedented challenge to eliminate the originality of pieces of content. In this research work, present an ensemble based model (A model that optimized combine output of 2 classifies) based on the combination of Linear regression and Support vector machines (SVM) for improving accuracy of detection for plagiarism. In order to perform an accurate identification of plagiarism, our proposed model uses the powerful TF-IDF, n-gram and co-sine similarity techniques in feature extraction. It achieved the accuracy of 94.5%, much higher than the accuracy of classical methods and single models, which are 90.2% and 85.7%, respectively. These findings highlight the promise of ensemble machine learning techniques to provide robust solutions for detecting plagiarism in an increasingly complex content landscape.

Keywords: *Plagiarism Detection, Ensemble Model, AI-Generated Content, Machine Learning, Feature Extraction.*

ICCI2025056: PARTICLE SWARM OPTIMIZATION WITH A BIDIRECTIONAL ENCODER REPRESENTATION FROM THE TRANSFORMERS TECHNIQUE FOR AMAZON PRODUCT REVIEW-BASED PRODUCT RECOMMENDATION

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ABSTRACT

With the rapid growth of Amazon's e-commerce, many consumers are sharing their subjective feelings about products online. Understanding consumer sentiment via product reviews is crucial for companies seeking to improve their products and services. The rise of online shopping has led to expanded online consumer reviews and difficult product selection. Previous Sentiment Analysis (SA) often has difficulty identifying emotions conveyed through online comments, especially emoticons. To combat previous issues, this research designs a Particle Swarm Optimization with a Bidirectional Encoder Representation from the Transformers (PSO-BERT) technique to rank the recommended product. In this proposed approach, data accumulated from the Amazon dataset consists of customer reviews for different products. Before computation, the collected dataset is pre-processed to remove insignificant text (review) and retain only necessary information using the SentiBagofWordNet (SBWNet) technique. After that, the Term Frequency Word2vector (TFW2v) method is used to find the connection among the words in the review. This paper especially presents the Random Gradient Emoji Weight Rate (RGEWR) technique utilized to analyze the Emoji with text weight in the Amazon product dataset. The proposed PSO-BERT method efficiently ranks the products. The outcomes indicate that the proposed PSO-BERT gains the most increased training and testing accuracies on the gathered Amazon dataset.

Keywords: *Amazon product, classification, emoji weight, ranking products, recommendation, reviews, Sentiment analysis (SA).*

ICCI2025057: INFLUENCE OF MOBILE LEARNING ON STUDENT HEALTH

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ABSTRACT

The aim of this paper is to identify the influence of mobile learning on students' health. The main purpose of this paper is to study the various health factors and mobile learning system's relations during the learning process. A comparative data collected from students among the undergraduate degree computer science & undergraduate degree business between the age groups 20 to 25. Total participants were 183 out of 320 students. The students were given the consent form before participating the study. This study highlights several factors about the use of mobile learning tools in blended learning environments like :

• Different devices such as PCs, smartphones, laptops, e-readers, and tablets offer varied experiences. These differences can affect how learners interact with the content and their overall learning experience.

• Several health-related factors are influenced by the use of these devices. The nature of the course material can impact cognitive load and stress levels.

• User Experience (UX) and User Interface (UI): Well-designed interfaces can reduce eye strain and improve engagement, while poorly designed ones can lead to frustration and fatigue.

• Graphics and Input Devices: High-quality graphics and intuitive input devices (like touchscreens or keyboards) can enhance learning but may also contribute to physical strain if not ergonomically designed.

• Personal Health Impact: The study likely examines how prolonged use of these devices affects physical health, such as posture, eye health, and repetitive strain injuries.

• Student Motivation: The level of student motivation can be influenced by the ease of use and accessibility of the learning tools. Engaging and interactive content can boost motivation, while technical difficulties can hinder it.

• Technical Difficulties: Issues such as connectivity problems, software glitches, and hardware malfunctions can disrupt the learning process and contribute to stress and frustration.

The study underscores the importance of considering these factors to optimize the health and well- being of learners in blended learning environments. It is also found that multiple usage mobile devices while learning helps the students to involve more in the learning activities. Alongside, we observed the time spent, compatibility, knowledge history, digital skills, duration of usage etc. creates another type of health issues due to e-learning. Predominantly,

use of technological devices has a direct impact on students' retina and physical stress. The digital divide plays an important role in this generation learners. This paper projects the slit among computer science and business discipline learners, health level and other parameters related to technology.

ICCI2025058: COMPARATIVE ANALYSIS OF DEEP LEARNING MODELS FOR EARLY DETECTION OF ADOLESCENT SUICIDAL IDEATION

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ABSTRACT

Suicidal ideation among adolescents is a critical public health issue, representing a significant risk factor for suicide attempts and completions. The increasing rates of suicidal thoughts in this age group highlight the urgent need for effective identification and intervention strategies. Early detection of suicidal ideation can lead to timely support and treatment, potentially saving lives. Given the complexity and variability of suicidal behaviors, advanced computational methods are necessary to improve predictive accuracy.This study presents a comprehensive comparative analysis of various deep learning algorithms for the identification of adolescents with suicidal ideation. The algorithms under consideration include Random Forest, Convolutional Neural Networks (CNN), CNN combined with Long Short-Term Memory (CNN-LSTM), Graph Convolutional Networks (GCN), and GraphSAGE. Additionally, a novel hybrid model integrating Graph Neural Networks (GNN) with reinforcement learning is proposed and evaluated. The objective is to determine the most effective model in accurately identifying adolescents at risk of suicidal thoughts. Each model's performance is rigorously assessed using relevant metrics and datasets, ultimately guiding the development of more efficient and accurate predictive models in the field of mental health.

Keywords: *Suicide Ideation, Adolescents, Random Forest, CNN, CNN-LSTM, Graph Convolutional Neural Network, GraphSAGE, Reinforcement Learning*

ICCI2025059: AI POWERED SOLUTIONS FOR FARMERS: AN AUTOMATED OTS-XGB MODEL FOR CLASSIFICATION OF WHEAT LEAF DISEASES USING TRANSFER LEARNING

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ABSTRACT

Wheat is a major food staple in India, and in the last 40 years, there have been significant improvements in its yield, resulting in a stable balance between supply and demand. However, with the expected increase in world population and dietary changes, there will be a need for significant yield increases in the coming decades. To achieve this, it is crucial to address fungal diseases that cause annual output losses of 15% to 20%. Flag smut, Powdery mildew, and Leaf blight are among the prominent wheat diseases contributing to these losses. Septoria and Stripe rust are two diseases that are not widely known but can have a significant impact on the output of grain crops. In order to address this issue, a new study has been proposed that aims to identify and categorize these diseases, as well as Healthy Leaf, using a recognition system. To achieve this, the study will use a pre-trained model called VGG-19 as a feature extractor and Otsu's threshold-based segmentation for image segmentation. The XG-Boost classifier technique will be used for classification. The proposed model, known as OTS-XGB, has achieved impressive results with an accuracy rate of 97.00%, precision rate of 96.00%, sensitivity/recall rate of 97.00%, and F1-score of 96.00%. This model will be a valuable tool for farmers and agronomists who need to identify and manage these diseases to ensure that their crop yields remain high. By expanding our knowledge of these diseases, we can develop more effective strategies for preventing and treating them, ultimately leading to increased food security and sustainability.

Keywords— *Image Processing, Wheat leaf diseases, Deep learning, VGG-19, Otsu's threshold-based Segmentation, XG-Boost.*

ICCI2025060: IMAGE SEGMENTATION AND QUANTIFICATION USING WAVELET TRANSFORM

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ABSTRACT

Image segmentation divides the original image into different non-overlapping parts to extract the desired region for various computer vision applications. Diverse methods exist to perform image segmentation, from traditional to AI; still, it is a challenging task in the image processing arena due to non-uniform intensities, poor contrast, shadow occlusion, irregular shape of an object, texture variations, noisy images, and different scalability. There is no global segmentation algorithm to address all these issues. Validation of the segmentation performance is also a difficult task, and it is mainly dependent on object detection rather than any standard metric. In this work, we performed image segmentation and quantification using the time-frequency domain to address segmentation issues like noisy images and multiscale resolution images for object detection. This work involves image segmentation using the wavelet thresholding method, then quantification by Haar wavelet transform, and finally, edge detection by Canny edge detection to obtain the median diameter of the object in the computer vision application. The proposed algorithm is flexible enough to adapt to different scaled images. The performance is validated with manually annotated data, and it exhibits 99% accuracy while locating the mean diameter of the desired object in the image.

Keywords: Image Segmentation, Quantification, Wavelet transform, Edge detection

ICCI2025061: DEMOGRAPHIC INFLUENCES ON TECHNOLOGY ACCEPTANCE AMONG HIGHER SECONDARY SCHOOL TEACHERS IN KERALA: A UTAUT-BASED QUANTITATIVE STUDY

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ABSTRACT

Technology integration has revolutionised teaching and learning practices, offering enhanced engagement and improved educational outcomes. This study investigates the demographic factors influencing technology acceptance among higher secondary school teachers in Kerala, utilising the Unified Theory of Acceptance and Use of Technology (UTAUT) as the theoretical framework. By analysing data from 496 teachers across various demographic categories, the research examines the impact of age, gender, teaching experience, additional qualifications, and type of school on technology acceptance. The findings reveal significant variations in technology acceptance based on gender, further qualifications, and teaching experience, while age and type of school showed no significant impact. Male teachers, those with additional qualifications, and those with less teaching experience demonstrated higher acceptance of technology. These insights provide valuable guidance for policymakers, administrators, and teacher training programs to design targeted interventions that foster effective classroom technology integration. The study contributes to the broader understanding of technology acceptance in education, highlighting the need for customised professional development and support mechanisms to enhance teachers' digital competencies and promote sustainable technology adoption.

Keywords: Integration technology, UTAUT, TPACK, Higher secondary school teachers of Kerala

ICCI2025062: ANALYSING AND PREDICTING COASTAL FLOOD RISK IN CHENNAI USING MACHINE LEARNING TECHNIQUES

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ABSTRACT

Coastal flooding presents a considerable risk to urban infrastructure and communities, particularly in low-lying areas such as Chennai, where swift urban development and climate change intensify susceptibility. This study combines geospatial intelligence with machine learning techniques to forecast flood risks and produce practical insights for managing disasters. Utilizing Digital Elevation Models (DEMs), rainfall patterns, tidal data, and historical flood records, the analysis pinpoints areas susceptible to flooding and models possible inundation scenarios. Utilizing advanced machine learning models such as Random Forest and Gradient Boosting allows for the exploration of relationships between geospatial and meteorological variables, thereby improving the accuracy of flood predictions. Moreover, geospatial visualization methods, such as interactive flood risk maps, provide valuable resources for urban planning and informed decision-making. The findings illustrate the effectiveness of integrating machine learning with geospatial analysis to enhance flood prediction precision and facilitate proactive disaster mitigation approaches. This study presents a flexible and scalable framework for assessing flood risk, which can be utilized by other coastal cities encountering comparable challenges.

Keywords: coastal flooding, machine learning, urban disaster management, environmental modelling

ICCI2025063: ROLE OF AI AND ML ALGORITHMS IN THE FIELDS OF MAGNETIC RESONANCE ANALYZERS, BIOENERGETICS, AND INFOCEUTICALS

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ABSTRACT

An AI algorithm is a set of instructions that tells the computer how to learn to operate on its own. AI algorithms work by taking in training data(labelled or unlabelled, supplied by developers, or acquired by the program itself) that helps the algorithm to learn, how that data is acquired and is labelled marks the key difference between different types of AI algorithms. Some AI algorithms can be taught to learn independently and take in new data to change and refine their process. Others will need the intervention of a programmer to streamline [1]. Magnetic Resonance Analyzer uses the weak magnetic field of human cells for scientific analysis. The study gives an insight into the various AI and ML algorithms used as a supplement during the medical report analysis generated through devices such as Quantum Magnetic Analyzer and Magnetic Resonance Imaging devices. The challenges in implementing AI and ML algorithms in the QMRA are discussed briefly. In addition, an insight into the usage of AI and ML algorithms in the fields of infoceuticals and bioenergetics is done in the study.

Keywords*: Artificial Intelligence(AI), Machine Learning (ML), Quantum Magnetic Resonance Analyzer(QMRA), Magnetic Resonance Imaging (MRI), Infoceuticals, Bioenergetics*

ICCI2025064: SMART HEALTHCARE SENSORS FOR FILTERING ULTRASOUND MEDICAL IMAGES USING COMBINATIONAL APPROACH FOR NOISE REMOVING (CANR) ALGORITHM

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ABSTRACT

Imaging for medical applications is the next challenging task for health care technology. A smart image capturing device with image filtering sensors can sense, supervise and detect diseases. In this work, the focus is on ailment-detecting devices that integrate sensors with accelerated computing capability by offering a practical, precise and low-cost solution for medical diagnosis. An image acquired with a cytoscope contains artifacts that can lead to misdiagnosis of the actual ailment. A Cytoscope equipped with sensors collects data from ultrasound images, filters out unwanted noise and thereby extracts ROIs from medical images using the CANR algorithm. This helps the patients avoid unnecessary complications from diagnosis and saves time in visiting multiple diagnostic centers. An efficient algorithm has been discussed, which involves an array of sensors that extracts the information from ultrasound medical images. In this study, the experimental work was carried out using ultrasound images of abdomen to detect gall stones. The accuracy and success of CANR was methodically inspected and the correctness of the framework was demonstrated. It is able to achieve an efficiency of 91.80 % to clear the undesirable noise from an ultrasound image without disturbing the characteristics of an image in healthcare.

Keywords: *Image Analysis, Ultrasound Images, Sensors, Gall Stones, Digital Images, Artifacts, Health Care*

ICCI2025065: PREDICTING PLANT HEALTH IN SMART FARMING USING IOT-ENABLED SENSORS

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ABSTRACT

Agriculture productivity has a significant impact on a nation's economy, and crop disease detection in early stage is crucial in this area. Plant quality and quantity of production suffer if the disease is not quickly identified. Delayed detection of plant disease is the main reason for less production of vegetables and fruits. Farmers can benefit a lot if disease related information is provided to them at the right time. Hence, the biggest obstacle to increased agricultural productivity is the accurate and prompt identification of infections in plants. Traditional detection methods are inaccurate, time-consuming, expensive, and subjective. Many intelligent solutions have been put forth by researchers for the automatic identification of plant leaf infections and for overcoming the limitations of the manual technique. In this research work, an IoT RGB sensor based approach is discussed to monitor plant health condition by analysing leaf images. The information gathered from IoT sensors is examined to identify potential plant infections by NSS image processing mechanism. This combined IoT and image processing approach is proved as a success and yields good results with an accuracy of 99.21% on 5 different types of leaves on publicly available dataset.

Keywords: Agricultural Plant production, IoT Sensors, plant leaf, NSS images, Image processing.

ICCI2025066: EFFICIENT NODULE FEATURE OPTIMIZATION BASED LUNG DISEASE PREDICTION MODEL USING DEEP CNN

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ABSTRACT

The problem of lung disease prediction has been well studied and there exist several approaches to handle this issue but suffer with higher overlap. To maximize the prediction accuracy, an efficient Nodule Feature Optimization with Deep CNN model (NFODCNN) is sketched. The model considers multiple nodule features like nodule mass, nodule texture, nodule distribution. To start with, the method preprocesses the lung image with Gray Level Mass Normalization algorithm which normalizes the image according to the gray values of nodule. Further, the method applies feature selection which selects a subset of features from the image according to the nodule mass selection value (NMSV). Next, the method extracts the features like nodule mass, nodule distribution and texture features. Extracted features are trained with the deep CNN model constructed with different layers of pooling and convolution. The convolution layers are designed to reduce the feature size of texture and the neurons at the output layers are designed to measure Lung Disease Attraction Value (LDAV). According to the LDAV value, the proposed NFODCNN model classifies the image to predict the lung disease with higher accuracy.

Keywords: Disease Prediction, Feature Optimization, NFODCNN, NMSV,LDAV, Lung Disease.

ICCI2025067: CYBERCRIMES IN SYNTHETIC MEDIA: A MULTIDISCIPLINARY APPROACH FOR DETECTION AND CONTROL

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ABSTRACT

The rapid increase in synthetic media produced or manipulated by Artificial Intelligence such as deepfakes, AI crafted images or voices, marks the beginning of a new chapter in creativity and communication. While these technological advancements bring new possibilities and opportunities in fields like entertainment and education, they also bring forward many new problems. There is an increased risk of misuse of such technologies through activities like spreading of misinformation, identity theft and fake or AI generated content. The misuse of synthetic media can also lead to cybercrimes like evidence manipulation which may affect the proper delivery of justice in cases. All this emphasizes the necessity for stricter laws and effective rules to safeguard against such threats. This research focuses on the development of synthetic media and its impact on society and also the moral dilemmas it creates. It also demonstrates the importance of regulations to manage risks and promote advancements in this field. By providing innovative solutions to the challenges, this research aims to support a balanced approach that increases the benefits of synthetic media while limiting any negative consequences.

Keywords: *synthetic media, cybercrimes, deepfakes, identity theft, technology, evidence manipulation, Artificial Intelligence*

ICCI2025068: BRIDGING EDUCATIONAL GAPS: DEVELOPING PLATFORM FOR STUDENTS WITH LEARNING DIFFICULTIES

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ABSTRACT

Slow learners, students with below-average cognitive abilities, often struggle to adapt to conventional education systems that fail to accommodate their unique learning needs. Although advancements in educational technology have focused on students with specific learning disabilities, the challenges faced by slow learners remain largely unaddressed. This research proposes the development of an inclusive digital platform designed to support slow learners through personalized learning methodologies, interactive tools, and engaging content. The platform, accessible in both online and offline modes, integrates adaptive assessments, gamify learning experiences, and flexible study schedules to enhance motivation, comprehension, and academic success. Leveraging artificial intelligence (AI) and data analytics, the system identifies individual learning patterns, strengths, and areas requiring intervention, enabling a tailored approach to education. Grounded in cognitive load theory, self-paced learning, and assistive technologies, this initiative bridges the gap between general and specialized education systems, creating a supportive environment for slow learners. The research highlights the need for scalable, inclusive solutions that empower slow learners to thrive academically and reach their full potential. By addressing their specific needs, this platform aims to redefine educational accessibility and foster long-term success in an increasingly demanding academic landscape.

Keywords*: Slow learners, Learning difficulties, Personalized learning, Educational technology, Adaptive assessments, Gamified learning, Artificial intelligence, Inclusive education.*

ICCI2025069: INTELLIGENT TUTORING SYSTEMS LEVERAGING COMPUTATIONAL INTELLIGENCE

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ABSTRACT

This paper explores the possibility of Intelligent Tutoring Systems (ITS) that incorporate computational intelligence to improve personalized learning experiences. The objective of this study is to determine how ITS can capitalize on artificial intelligence techniques, including machine learning and natural language processing, in order to effectively respond to individual needs of the students. It consists of a deep review of current ITS frameworks as well as integration of computational intelligence tools to test adaptive learning models. Key findings include the following: ITS integrating computational intelligence shows significant improvement in learning outcomes with the identification of knowledge gaps and provision of adaptive feedback. Its significance lies in advancing educational technology, fostering fair access to quality education, and paving the way for more effective learning environments.

Keywords: Intelligent Tutoring Systems (ITS), Machine learning, Natural language processing (NLP)

ICCI2025070: ADVANCING RECOMMENDER SYSTEMS FOR MALAYALAM: CHALLENGES, INNOVATIONS, AND MODEL APPLICATIONS

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ABSTRACT

Recommender systems have become indispensable in elevating user experiences across all domains. Nevertheless, the research and development of such systems using the Malayalam language, which could benefit the internet accessibility of millions of users of the language, remains largely underexplored.

The goal of this survey is to fill the void by providing a thorough analysis of the existing recommender systems using mainstream languages and comparing them with their Malayalam counterparts while briefing the challenges and innovations in building recommender systems for Malayalam-speaking users.

The paper delves into language-specific complications and reviews significant research efforts and practical implementations addressing these challenges underscoring techniques, tools, and results. Additionally, we have applied MalayaLLM and Navarasa 2.0, two advanced language models, to build a basic recommender system tailored for Malayalam-speaking users, demonstrating their utility and effectiveness in addressing language-specific challenges. We put forward potential directions for future research including integration of deep learning techniques, harnessing multilingual resources and developing domain-specific solutions. By consolidating this knowledge, this paper aims to serve as a fundamental resource in assisting advancement and accessibility in recommender system design for underrepresented languages such as Malayalam.

Keywords: Recommender systems, Malayalam language, MalayaLLM, Navarasa 2.0, multilingual resources, language-specific challenges, deep learning techniques, domain-specific solutions, underrepresented languages.

ICCI2025071: DETECTING CREDIT CARD FRAUD WITH MACHINE LEARNING – A COMPARATIVE APPROACH

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ABSTRACT

Recently, there has been an increase in the number of transactions involving digital money, which has been accompanied by an increase in the total number of transactions. Learning by machine is dependent on the data that is provided to it. Credit card fraud statistics is biased, according to the data. Due to the limited number of fraudulent transactions, a skewed data set produces findings that are not optimal for the various machine learning algorithms under consideration. Using the outcomes of under-sampling and over-sampling, a comparison is made between the various algorithms that are taken into consideration. Logistic Regression, Decision Tree, Random Forest, Adaboost classifier, Stochastic Gradient Descent classifier, K Nearest Neighbour, Gaussian Naive Bayes, and Support Vector Machine are some of the methods that have been investigated. Distinct results are obtained by under-sampling and over-sampling, respectively. When it comes to undersampling, the Adaboost classifier produces positive results, whereas the Random Forest method exhibits remarkable performance when it comes to oversampling. There are a number of metrics for performance that are used to evaluate algorithms.

Keywords: *Cedit card fraud, Machine learning, Under sampling, Over sampling*

ICCI2025072: ENHANCING STUDENT ENGAGEMENT WITH SUSTAINABLE DEVELOPMENT GOALS THROUGH GAMIFICATION AND ARTIFICIAL INTELLIGENCE IN THE LEARNING ENVIRONMENT

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ABSTRACT

To involve learners in the Sustainable Development Goals (SDGs) within the classroom setting, AI and gamification are likely to prove very effective tools. Gamified learning environments and AI-powered resources could enhance knowledge and motivation toward the SDGs as educational institutions seek innovative approaches to promote student engagement with global sustainability challenges. The present study explores introducing students to SDGs in class using gamification and AI. This research identifies innovative ways through which educational institutions can promote student engagement with issues of global sustainability, as this research looks into the ways gamified learning environments and AI-powered resources could improve the understanding and motivation towards SDGs. The study discovers that gamification of various techniques supports active inquiry for SDGs and hence includes points systems, challenges, and simulations. AI can be demonstrated as capable of personalized learning, thus students will discover interests in and competence related to their sustainability areas of interest. Promoting the significance of SDGs in the class environment is, therefore, highly relevant as students gain awareness of and assume responsibilities toward a future where sustainable change may take place. The ultimate purpose of this study is to offer teachers helpful structures for gamification and the inclusion of AI into their teaching methods, which should lead to more interesting and significant investigation of SDGs. In this way, we can engage a new generation of knowledgeable and accountable global citizens committed to building a sustainable future through enabling students to take an active role in their educational journey.

Keywords - *Sustainable Development Goals, student engagement, artificial intelligence, gamification, learning environment, educational innovation, gamified learning, personalized, learning, sustainability education, teaching strategies, global citizenship, interactive learning.*

ICCI2025073: BLOCK-CHAINED BASED INTELLECTUAL PROPERTY MARKETPLACE

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ABSTRACT

The rise of digital content creation has highlighted persistent challenges in traditional intellectual property (IP) marketplaces, including lack of transparency, revenue misallocation, and reliance on intermediaries. This project explores a blockchain-based decentralized IP marketplace that empowers creators by enabling direct transactions with consumers. By leveraging blockchain's immutable ledger and smart contract technology, the proposed system ensures transparent ownership records, automated royalty distribution, and secure licensing processes. The study outlines a conceptual design for the marketplace, evaluates its potential benefits over traditional systems, and addresses implementation challenges such as scalability and cost. This framework aims to redefine IP management, offering a fair and efficient solution for the creative economy.

Keywords: Blockchain Technology, Intellectual Property (IP), Decentralized Marketplace, Smart Contracts, Revenue Transparency, Digital Ownership.

ICCI2025074: DETECTING AND MANAGING CONCEPT DRIFT IN MACHINE LEARNING

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ABSTRACT

Concept drift, a phenomenon where the statistical properties of the target variable shift over time, poses a significant challenge to the reliability of machine learning models. This change can lead to a decline in model accuracy, particularly in dynamic environments requiring real-time analytics. Effective detection and mitigation of concept drift are crucial to maintaining the performance of predictive models. This paper provides a comprehensive overview of concept

drift, its implications for machine learning algorithms, and the techniques used to identify and manage it. It delves into the challenges of drift detection, highlights advanced methods to tackle them, and underscores the necessity of continuous monitoring and adaptive strategies to ensure robust model performance in the face of evolving data distributions.

Keywords: Concept drift, Machine learning, Model accuracy, Drift detection, Real-time analytics, Adaptive modelling

ICCI2025075: DYNAMIC DOM VISUALIZATION AND ADAPTIVE STRATEGIES FOR REAL-TIME XSS DETECTION AND MITIGATION

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ABSTRACT

XSS (Cross-Site Scripting) attacks continue to pose a significant security threat to web applications, often exploiting vulnerabilities in user input handling and browser rendering. This research presents an innovative approach combining dynamic DOM (Document Object Model) visualization with adaptive real-time strategies for detecting and mitigating XSS attacks. The study proposes a system that utilizes React for frontend visualization and Node.js for backend detection, providing a comprehensive solution for monitoring DOM changes in real-time and dynamically responding to malicious activities. The approach leverages a hybrid detection mechanism, incorporating both static pattern-matching techniques and adaptive machine learning models to detect both known and emerging XSS threats. By utilizing dynamic DOM visualization, the system offers security analysts an interactive and immediate view of malicious manipulations, enabling quicker detection and mitigation. This paper demonstrates the effectiveness of the proposed solution with results showing high detection accuracy and low latency, offering an efficient and scalable solution for real-time XSS defense. The significance of this work lies in its potential to enhance web application security by automating the detection and mitigation of XSS attacks, reducing dependency on manual intervention, and improving overall protection against evolving threats.

Keywords- XSS Detection, Dynamic DOM Visualization, Real-Time Mitigation, Web Security, Machine Learning, Cross-Site Scripting.

ICCI2025076: THE ROLE OF COMPUTER VISION IN SUSTAINABLE AGRICULTURE: APPLICATIONS, TECHNOLOGIES, AND CHALLENGES

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ABSTRACT

Agriculture is one of the fastest and improving AI driven sector in the late 20's. These developments in the sector have helped with a good yield. The latest technologies in the Satellites, Sensors, Drones and more techs are available anywhere around us. These upgrades have brought a great impact in the agriculture sector A huge volume of data is collected and processed for decision making. The aim of this paper is to give an understanding about the fusion of Artificial Intelligence and smart farming to attain sustainable agriculture. Constant Monitoring of the plant's health like disease detection, watering, nutrients deficiencies etc... by analyzing the plant images. Plant health is an important factor so we propose a technique to understand about the plants from the visual with the help of convolutional networks. After collecting the data from drones, satellites and weather stations, farmers can get a good understanding about the crop's health, environment and the needs. Early detection of diseases or nutrients deficiency through analyzing the data can help to reduce the use of chemicals and focus more on healthier crops. In general, fusion of AI and computer vision have the potential to revolutionize agriculture but there are challenges too but can be solved through constant developments and practices.

Keywords: Artificial Intelligence (AI), Computer Vision, Convolutional Neural Networks (CNN), Data-Driven Decision Making, AI-Driven Yield Improvement, Data Fusion Techniques, Precision Agriculture.

ICCI2025077: ARTIFICIAL INTELLIGENCE IN OPHTHALMIC SURGERY: CURRENT APPLICATIONS AND EXPECTATIONS

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ABSTRACT

Artificial Intelligence (AI) has emerged as a transformative tool in ophthalmology, particularly in enhancing precision and decision-making in ocular disease management. Ophthalmic surgery, known for its complexity and reliance on exceptional precision, stands to benefit significantly from AI integration. This paper explores the current applications and future potential of AI in ophthalmic surgery, focusing on diagnostic tools, pre-surgical decision-making, intraoperative assistance, and postoperative management. AI is already being utilized in real-world settings, such as diabetic retinopathy detection by systems like IDx-DR and predictive analytics in cataract surgery planning. Robotic-assisted platforms and AI-guided laser systems enhance intraoperative precision, while smartphone applications like EyeArt democratize access to diagnostic tools.

Despite these advancements, challenges such as data privacy, regulatory approval, and cost remain barriers to widespread adoption. Case studies, including DeepMind's collaboration with Moorfields Eye Hospital, highlight the efficacy of AI in diagnosing and managing ocular conditions with expert-level accuracy. The findings emphasize AI's transformative role in improving patient outcomes, optimizing surgical precision, and expanding access to care. As innovations continue, AI is expected to become an integral component of ophthalmic surgery, reshaping clinical practices and enhancing global healthcare accessibility.

Keywords: *Artificial Intelligence, Ophthalmic Surgery, Diabetic Retinopathy, Robotic Surgery, Precision Medicine, Teleophthalmology*

ICCI2025078: IDENTIFYING THE INFLUENTIAL INDEXED KEYWORDS OF SCOPUS BIBLIOGRAPHIC DATASET FOR COMMUNITY DETECTION

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ABSTRACT

The process of identifying group of keyword as nodes within a network based on how closely nodes are function together referred as keyword based community detection. This article proposes a methodology for detecting communities which extracted from Scopus bibliographic data by converting it into graph for analysing keyword pairs within the network. The graph represents information about node as keywords and co-occurrence relationship between keywords as edges. The main aim of this work is to provide the fundamental idea as framework for performing community detection on indexed keywords bibliographic data via numerous techniques. This work explores techniques such as keyword analysis, frequency distribution, influential keyword identification by using network collaboration and finally by applying community detection methods to keywords. Louvain method discovered ten distinct communities from the dataset. The proposed methodology enables effective keyword community detection within Scopus data and also provides a framework to analyze influential relationships through advanced methods.

Keywords: *Community Detection, Scopus Bibliographic Data, Keyword Network Collaboration, Co-occurrence Network, Keyword Analysis, Complex Network*

ICCI2025079: ENHANCING FORENSIC FACIAL RECONSTRUCTION USING GANS: A MULTI-INPUT FUSION APPROACH

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ABSTRACT

Forensic facial identification often struggles with the limitations of ambiguous sketches, degraded CCTV footage, and subjective witness descriptions. This research introduces a novel approach leveraging Generative Adversarial Networks (GANs) to enhance identification accuracy through a multi-input fusion framework. The proposed system integrates diverse input modalities—sketch-to-image generation, noise reduction for low- quality footage, and text-prompted image synthesis—to reconstruct realistic facial profiles. By merging outputs from these sources, the framework ensures higher reliability when matching against criminal databases. A feedback loop further refines outputs, enabling iterative improvements based on updated descriptions or corrections. This approach represents a significant advancement in forensic technology, addressing key challenges and paving the way for more accurate, efficient, and adaptable criminal identification systems.

Keywords- *image reconstruction pipeline, hybrid image processing, deep learning forensics, edge-to-image transformation, feedback loop, AI-based image enhancement, Multi input image model, GANs image generation, suspect identification.*

ICCI2025080: LINGO: ROOT-BASED TRANSFER LEARNING FOR LOW-RESOURCE LANGUAGE MODELING

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ABSTRACT

Low-resource languages remain underrepresented in natural language processing (NLP) due to insufficient training data and the high computational costs of developing individual models for each language. We propose LINGO, a novel framework leveraging linguistic roots and shared morphological patterns to facilitate cross-lingual generalization in related languages and dialects. LINGO integrates root-based vocabulary clustering, phonetic and morphological

transformation rules, and multilingual embedding alignment, enabling more efficient adaptation from high-resource languages to their low-resource counterparts. By utilizing linguistic structures as the foundation for knowledge transfer, LINGO reduces reliance on large-scale annotated datasets while maintaining language adaptability and scalability. This framework presents opportunities for enhancing machine translation, text generation, and speech applications in underserved linguistic communities. Additionally, LINGO holds potential for voice assistants, educational tools, and AI-driven cultural preservation, expanding NLP model accessibility across diverse language landscapes. This paper outlines the LINGO framework, providing a structured methodology for further exploration and evaluation in future research.

Keywords: Root-Based Transfer Learning, Low-Resource Language Modeling, LINGO Framework, Cross-Lingual Generalization, NLP for Low-Resource Languages, Multilingual Embedding, Morphological Transformation, Knowledge Transfer, Machine Translation, Speech Applications, AI for Cultural Preservation, and Voice Assistants.

ICCI2025081: LEXAI: ENHANCING JUDGMENT CITATION RETRIEVAL AND CASE OUTCOME PREDICTION

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ABSTRACT

Legal research and case analysis are vital components of the legal profession, yet the process of retrieving relevant case judgments and predicting case outcomes remains time-consuming and complex. LexAI leverages the power of artificial intelligence to streamline judgment citation retrieval and provide insights into potential case outcomes. By utilizing natural language processing (NLP) techniques and machine learning models, LexAI efficiently analyzes legal texts, understands complex queries, and retrieves relevant case citations based on semantic meaning rather than simple keyword matching. Additionally, it uses predictive modeling to forecast case outcomes by analyzing patterns in historical data. This paper presents the development and evaluation of LexAI, highlighting its potential to reduce research time, enhance decision-making, and improve the overall efficiency of legal practices.

Keywords: Legal AI, Judgment Retrieval, Case Prediction, Machine Learning, Natural Language Processing, LexAI

ICCI2025082: AI-BASED CYBER THREAT DETECTION: OPPORTUNITIES, CHALLENGES, AND INNOVATIONS

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ABSTRACT

With the increasing sophistication and frequency of cyber threats, conventional security measures often fall short in providing effective real-time threat detection and response. Artificial Intelligence (AI) has emerged as a powerful tool in cybersecurity, leveraging machine learning, deep learning, and natural language processing to analyse vast datasets, recognize patterns, and predict potential threats with enhanced accuracy. This paper examines the application of AI in cyber threat detection, focusing on its capabilities, limitations, and recent advancements. It also addresses key challenges, such as adversarial attacks, data privacy risks, and ethical concerns associated with AI-driven security systems. Furthermore, the study explores innovations in AI-powered cybersecurity, including anomaly detection, automated threat intelligence, and AI-assisted risk assessment. While AI significantly enhances cybersecurity defences, it also introduces new vulnerabilities that require continuous refinement of security strategies. The paper concludes by highlighting future research directions to improve AI-based cyber threat detection systems.

Keywords: Artificial Intelligence, Cybersecurity, Threat Detection, Machine Learning, Cyber Defence, AI Security

ICCI2025083: ENHANCING HUMAN ACTIVITY CLASSIFICATION WITH ENSEMBLE LEARNING AND BIG DATA ANALYTICS USING SENSOR DATA

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ABSTRACT

This paper introduces a novel method for categorizing human activities using sensor data from IoT devices. The proposed algorithm enhances activity prediction accuracy and robustness by

combining ensemble learning with big data analytics. It constructs an integrated ensemble of base classifiers by leveraging various machine learning techniques, including KNN, KNN with grid search, decision trees, gradient-boosted decision trees, random forests, and optimized random forests. This ensemble approach reduces individual biases and errors, enabling effective handling of diverse sensor datasets and better generalization to new data. Experimental evaluations on well-known datasets such as WISDM, HAPT, HAR, and KU-HAR demonstrate the algorithm's superior performance in activity classification. By accurately predicting human activities, this method supports personalized healthcare, optimized athletic performance, and improved efficiency in smart homes and buildings.

Keywords: Big Data analytics , Ensemble learning ,Human Activity Classification, IoT Sensor-datasets, Machine Learning techniques

ICCI2025084: AN INVESTIGATIVE SURVEY ON SCALABLE DATA PROCESSING USING MULTILAYER PERCEPTRON NETWORKS FOR BIG DATA ANALYSIS

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ABSTRACT

This research survey aims to provide an in-depth exploration of the strategies and methodologies employed in utilizing multilayer perceptron (MLP) networks for scalable data processing in the realm of big data analysis. Given the exponential growth in data volume and the increasing demand for real-time analytics, scalable solutions have become imperative. MLP networks present a promising avenue due to their capability to decipher complex data patterns. This paper systematically surveys existing literature, identifies prominent trends, discusses prevalent challenges, and proposes potential avenues for future research in this domain.

Keywords— Scalable Data Processing, Multilayer Perceptron Networks, Big Data Analysis, Research Survey, Scalability Challenges

ICCI2025085: NATURAL LANGUAGE PROCESSING: FROM ITS ROOTS TO THE ERA OF INTELLIGENT AI

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ABSTRACT

NLP has gone through a remarkable revolution from its origin in linguistic theory to the moment of intelligent artificial intelligence and natural language processing in the beginning, NLP relied on symbolic techniques and rule-based systems accentuated the use of pre-established rules for language parsing and comprehension. The rise of computational power, probabilistic models and big corpora made it possible the generation of language through analysis and statistical techniques. NLP underwent a drastic change with the emergence of deep learning in the 2010s, which brought with it strong models like transformers, recurrent neural networks (RNNs), and word embedding that made it possible to generate, and interpret more complex text. And process more intricate text. With the invention of large-scale pre-trained models such as GPT-3, and BERT that could do several tasks with unbeatable accuracy, comprehend text, and produce text that is similar to human-written NLP set foot in into the modern era of artificial intelligence. The invention of DeepSeek was a key turning point in this evolution triggering more sophisticated contextual responses and deeper semantic understanding further enhancing contextual response and fostering wider innovation in the field. Through all these evolutionary shifts NLP has risen to unprecedented levels of performance.

Keywords: *Natural Language Processing (NLP), Linguistic Theory, Rule-Based Systems, Statistical Models, Deep Learning, Transformers, Recurrent Neural Networks (RNNs), Word Embeddings, GPT-3, BERT, Intelligent AI, Language Generation, Context Comprehension, Pre-Trained Models, Language Processing, AI Models*

ICCI2025086: UNDERSTANDING CONSUMER BEHAVIOUR IN E-COMMERCE SEGMENT THROUGH SENTIMENT ANALYSIS AND TOPIC MODELLING

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ABSTRACT

Sentiment analysis is a powerful tool for understanding customer perceptions, opinions and preferences through customer reviews given for products sold through online ecommerce portals. Customer sentiment plays a vital role in shaping purchasing decisions and understand consumer behaviour. This study explores sentiment trends across different product categories such as electronics, clothing, and books sold from a popular ecommerce website. It used 701,238 reviews collected from an ecommerce website across different product categories spanning from 2016 to 2023. Understanding sentiment trends can provide valuable insights for businesses looking to optimize their offerings and marketing strategies. It uses machine learning techniques to classify and analyse the sentiments expressed through text in the ecommerce portals. This study aimed to analyze customer sentiment in three key product categories—electronics, clothing, and books—and explored its relationship with product ratings. Using Natural Language Processing (NLP) techniques such as sentiment analysis, topic modelling, and word cloud generation, customer reviews were analysed from the e-commerce platform. This study helped in identifying key themes discussed in the reviews using unsupervised machine learning. Visualising sentiment distribution across different product categories provided actionable insights for businesses seeking to enhance customer experience and enhance their marketing strategies. This study explored sentiment trends across different product categories sold from a popular ecommerce website. Findings of the study reveal distinct sentiment patterns across categories, highlighting correlations between sentiment scores and ratings. Future research directions include real-time sentiment tracking and deeper sentiment-based segmentation.

Keywords: Sentiment analysis, NLP, topic modelling, word cloud.

ICCI2025087: A SURVEY AND COMPARATIVE ANALYSIS ON DEEP LEARNING APPROACHES FOR TAXONOMIC LEVEL CLASSIFICATION OF INSECTS

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ABSTRACT

Numerous insects are advantageous from a human perspective as they contribute to pollination, produce valuable substances, regulate pest populations, serve as scavengers, and function as a vital food source for other animals. Insects play a pivotal role in environmental studies, often serving as indicators of water quality, soil contamination, and biodiversity benchmarks. They represent a dominant portion of the current terrestrial fauna, with approximately [1] million species formally described. This constitutes roughly three-quarters of all known animal species. The conventional approach to insect identification, relying on their morphological features, demands expert taxonomists and can be quite meticulous. In recent times, machine vision has been applied across diverse agricultural do- mains, including but not limited to crop health and soil conditions, assessing the quality of fruits, identifying plant diseases, and detecting of insect pests. The ad- vent of deep learning algorithms has further enhanced capabilities in insect detection and classification. However, classifying insects at the taxonomic level re- mains a challenging endeavor, especially considering expert estimations that the actual count of living insect species might range between 5 and 10 million. This survey paper, presents an overview of taxonomic classification of insects, re- search work pertaining to insect and other species classification, different kinds of available image datasets of insects, various augmentation methods used to solve data imbalance problems, deep learning approaches and role of pre-trained models in insect classification task. A detailed analysis of related research from the period 2018 to 2024 has been carried out and presented in an effective manner. The paper summarizes the challenges in taxonomic level classification from order to species.

Keywords: *Taxonomic level classification, Machine Vision, Augmentation, Deep learning, pre-trained models.*

ICCI2025088: EMOTION RECOGNITION FROM FACIAL EXPRESSIONS USING DEEP LEARNING

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ABSTRACT

Image recognition is a crucial task in computer vision, with wide-ranging applications in fields such as security, healthcare, and human-computer interaction. Recognizing emotions from facial expressions is one of the most challenging aspects of image recognition, as it requires interpreting subtle visual cues such as facial muscle movements and micro-expressions. Deep learning has emerged as a powerful approach to image recognition due to its ability to automatically learn complex features from raw image data, eliminating the need for manual feature extraction. This study focuses on emotion recognition from facial expressions using deep learning, applied to a dataset of 35,685 grayscale images of human faces. The images are categorized into seven emotional expressions: happiness, neutral, sadness, anger, surprise, disgust, and fear. We employ a convolutional neural network (CNN) to classify emotions, leveraging its ability to capture spatial hierarchies and patterns in image data. The model is trained on a large dataset, and its performance is evaluated using accuracy, precision, recall, and F1-score. The results demonstrate that deep learning, particularly CNNs, significantly outperforms traditional machine learning methods in emotion recognition tasks, providing high accuracy and robustness. This research underscores the potential of deep learning for automating facial emotion detection and offers insights into its applications in various domains, including mental health monitoring, interactive systems, and security.

Keywords: Emotion recognition, facial expressions, deep learning, image recognition, convolutional neural networks, emotion classification, machine learning, facial analysis, computer vision, emotion detection.

ICCI2025089: FRAMEWORK FOR RANK ATTACK DETECTION IN RPL

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ABSTRACT

IoT is the blooming technology in the recent years. It connects anything at any time at anywhere through Internet. It makes the human life to be sophisticated. It provides the comfort zone for the human by unitizing the automation process through Internet facility. Inasmuch as things are connected through Internet, providing security is necessary. From many security requirements, network security is the major security requirement in IoT. Many researchers are spotlighting on the RPL based network security issues which is the predominant issue in IoT. Rank attack is one of the issues in the RPL based network issues. In this paper, a secured STARO framework is proposed to solve the rank attack issues in IoT. STARO framework is the combination of three techniques namely level based rank attack detection technique (LEACE), Received Signal Strength Indicator (RSSI) based rank attack detection technique (RACE) and location based rank attack detection techniques (LACE). The framework is evaluated using Cooja simulator over Contiki operating system. It performs better in terms of packet delivery ratio, throughput and attack detection rate.

It is so difficulty to find out rank attack in the RPL network. Though, there are few techniques to detect rank attack in RPL based IoT network, there is no proper framework to detect rank attack based on objective functions. This paper combines the three techniques as a framework. The framework detects the rank attack based on the objective function (OF) which is used for constructing the RPL network.

Keywords: *IoT, Network security, STARO Framework, RPL security*

ICCI2025090: LEVERAGING AI TO ENHANCE CAREER COUNSELING ACCESSIBILITY FOR STUDENTS IN INDIA: THE ROLE OF LARGE LANGUAGE MODELS

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ABSTRACT

There is a wide gap between what students are advised for, and the broad range of jobs that are open to employment. With over 250 possible career choices, in India, 93% only know about a handful of overcrowded traditional ones. And thus, they find themselves rushing into conventional jobs, often unaware of the newer industries closely related to their skills. The scarcity of experienced career counselors aggravates this problem, particularly in rural and economically deprived regions. This paper explores the possibilities by which Large Language Models could address the issues related to career counseling in India. Analyzing huge datasets and grasping unique inputs of students, LLMs can generate data-driven, personalized career guidance for them. Such AI systems can take into consideration interest in academics, extracurricular activities, personal attributes, and emergent trends in jobs, reducing dependency on human counselors and providing high-quality advice to each student irrespective of location and economic status. The platform may also democratize career guidance by making access more affordable, accessible, and constantly updated. It gives access to various professional routes by eliminating conventional biases. With LLMs, even job transitions and upskilling can help students keep competitive in a constantly changing job environment. Ultimately, this AI-led approach provides personalized, fair, and timely career counselling, transforming the landscape of career guidance in India, making this resource accessible to all. LLMs demonstrated high precision (95%) in generating personalized career guidance, bridging gaps in conventional counseling, especially in underserved regions.

Keywords: *Large Language Models (LLMs), Career counseling, AI-driven platforms, Personalized guidance, Scalable solutions, Data-driven recommendations, Democratizing career guidance, Accessible and affordable counseling, Unbiased recommendations, Emerging career opportunities, Dynamic Workforce, Informed decision-making*

ICCI2025091: ENHANCING STUDENT ENGAGEMENT WITH SUSTAINABLE DEVELOPMENT GOALS THROUGH GAMIFICATION AND ARTIFICIAL INTELLIGENCE IN THE LEARNING ENVIRONMENT

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ABSTRACT

AI and gamification are likely very effective tools for involving learners in the sustainable development goals (SDGs) within the classroom setting. Gamified learning environments and AI-powered resources could enhance knowledge and motivation toward the SDGs as educational institutions seek innovative approaches to promote student engagement with global sustainability challenges. The present study explores using gamification and AI to introduce students to SDGs in class. This research identifies innovative ways through which educational institutions can promote student engagement with global sustainability issues, as this research looks into how gamified learning environments and AI-powered resources could improve the understanding and motivation towards SDGs. The study discovers that gamification of various techniques supports active inquiry for SDGs and hence includes points systems, challenges, and simulations. AI can be demonstrated as capable of personalised learning. Thus, students will discover interests in and competence related to their sustainability areas of interest. Promoting the significance of SDGs in the class environment is, therefore, highly relevant as students gain awareness of and assume responsibilities toward a future where sustainable change may occur. The ultimate purpose of this study is to offer teachers helpful structures for gamification and the inclusion of AI into their teaching methods, which should lead to a more enjoyable and significant investigation of SDGs. In this way, we can engage a new generation of knowledgeable and accountable global citizens committed to building a sustainable future by enabling students to take an active role in their educational journey.

Keywords: *Sustainable Development Goals, student engagement, artificial Intelligence, gamification, learning environment, educational innovation, gamified learning, personalized learning, sustainability education, teaching strategies, global citizenship, interactive learning*

ICCI2025092: MULTIMODAL FAKE NEWS DETECTION: INTEGRATING TEXT, VISUAL, AND AUDIO CUES FOR ENHANCED CREDIBILITY ASSESSMENT

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ABSTRACT

The proliferation of fake news across various media platforms necessitates advanced detection methods that transcend traditional text-based analysis. This research proposes a multimodal framework that integrates textual, visual, and audio data to evaluate the credibility of news articles. By employing deep learning models capable of processing and correlating information from these diverse modalities, the framework aims to identify inconsistencies and patterns indicative of misinformation. The proposed system utilizes convolutional neural networks (CNNs) for image analysis, recurrent neural networks (RNNs) for audio processing, and transformer-based models for text comprehension. The fusion of these modalities is achieved through a hierarchical attention mechanism that prioritizes salient features across different data types. Preliminary experiments on a curated multimodal news dataset demonstrate the potential of this approach in enhancing detection accuracy compared to traditional text-only models.

Keywords: *Multimodal fake news detection, hierarchical attention mechanism, deep learning, textual analysis, visual analysis, audio analysis, transformer models, convolutional neural networks, recurrent neural networks, misinformation detection, deepfake detection, data fusion, feature extraction, machine learning, natural language processing, computer vision, speech processing, cross-modal analysis, information credibility, media forensics.*

ICCI2025093: DIGITAL REVITALIZATION: LEVERAGING AI AND UI/UX TO PRESERVE MARAM FOLK TALES AND ORAL TRADITIONS

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ABSTRACT

This paper explores how accessible AI tools—such as Natural Processing Language(NLP) language transcription systems and Text-to-speech(TTS) voice narration technologies—combined with intuitive UI/UX design, can digitize and preserve the oral traditions of the Maram tribe in Northeast India. Grounded in qualitative methodologies (Smith, 2012), the research prioritizes collaboration with Maram elders to document folk tales, cultural idioms, and historical narratives, aligning with decolonial frameworks for indigenous knowledge preservation (Christen, 2011). By employing user-centered design principles (Norman, 2013), the study prototypes a storytelling platform that mirrors Maram cultural aesthetics while integrating AI-driven audio narrations for linguistic authenticity, a practice validated in low-resource language preservation efforts (Bird, 2020). To enhance engagement, the project incorporates an interactive virtual tour (developed using 3D Vista), enabling users to explore heritage sites, view traditional artifacts, and experience stories narrated in native dialects. This initiative emphasizes community participation, with usability testing conducted among Maram youth and cultural stakeholders to ensure ethical and culturally resonant outcomes, echoing participatory design methodologies in ICT for development (Kumar & Puri, 2018). By bridging indigenous knowledge with accessible technology, the study demonstrates how low-barrier digital tools can empower marginalized communities to safeguard their heritage, a principle advocated in UNESCO's Convention for the Safeguarding of Intangible Cultural Heritage (2003). The findings offer a scalable model for preserving endangered oral traditions globally, highlighting the role of participatory design in cultural revitalization and aligning with the UN's Declaration on the Rights of Indigenous Peoples (United Nations, 2007).

Keywords: *AI, NLP, TTS, UI/UX, Oral Tradition Preservation, Maram Culture, Digital Archive*

ICCI2025094: LEVERAGING LLAMA FOR MALAYALAM NEWS SUMMARIZATION - AN EXPERIMENTAL STUDY

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ABSTRACT

Recent years have experienced tremendous advancements in natural language processing (NLP) because of the development of complex language models that have automated a number of NLP applications including text summarization. Despite this progress, Malayalam text summarization still faces challenges because of the peculiarities of the language. This research paper explores the potential of using a large language model, specifically the LLaMA(Large Language Model Meta AI) framework, for text summarization in the Malayalam language. In order to study the performance of LLaMA we created Malayalam news dataset with News and reference summary and calculated the ROUGE score of the generated summary with the reference summary.

Keywords: *Large Language Models, Malayalam, LLaMA, TextSummarisation, Rouge*

ICCI2025095: NANOPARTICLE-ENHANCED RAYLEIGH-BÉNARD CONVECTION: BIFURCATION ANALYSIS VIA PHYSICS-INFORMED NEURAL NETWORKS

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ABSTRACT

A single-phase system is used to represent Rayleigh-Bénard convection in liquids containing nanoparticles, where the presence of the particles alters the liquid's density, viscosity, heat capacity, thermal conductivity, and thermal expansion coefficient. The tri-modal Lorenz model is derived assuming small-scale convective motions and the Boussinesq approximation for the rigid-rigid isothermal boundary conditions. The Ginzburg–Landau equation is derived using the generalized Lorenz model. The function of bifurcation mechanisms and Physics-Informed

Neural Networks (PINNs) based on machine learning is investigated. One of the three fixed points of the cubic Ginzburg-Landau equation takes place during the pre-onset phase, whereas the other two take place during the post-onset phase. Because the pre-onset bifurcation point is unstable throughout post-onset timeframes, there is a pitchfork bifurcation point. The Lorenz Model is a system of nonlinear differential equations used in fluid dynamics to explain chaotic behavior, and thus presents numerous challenges because of high complexity and sensitivity to the initial conditions. This study looks into using Physics-Informed Neural Networks as an alternative method for solving the Lorenz system. Direct inclusion of the underlying physical equations in the training procedure offers significant advantages with the application of PINNs. These advantages include good ability to deal with chaotic behavior, incorporation of boundary and starting conditions, and reducing dependence on large datasets.

Keywords: Rayleigh-Bénard, Nanoliquids, Lorenz model, Ginzburg-Landau equation, Bifurcation, Physics-Informed Neural Networks.

ICCI2025096: ASSESSMENT AND MEASUREMENT OF STUDENTS' SOCIAL AND EMOTIONAL LEARNING (SEL) COMPETENCIES

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ABSTRACT

Social and Emotional Learning (SEL) has a profound influence on students' academic performance, personal development, and overall well-being. The purpose of this study is to evaluate and quantify how well college students are developing the SEL competencies of self-awareness, self-management, social awareness, relationship skills, and responsible decision making. Data was gathered from a sample of students in different fields using a standardized questionnaire based on the CASEL framework. The questionnaire focused on students' self-perceptions of their emotional intelligence and interpersonal skills, measuring SEL competencies on a 5-point Likert scale. K-means clustering was used to evaluate the gathered data in order to find trends and classify pupils according to their SEL development. With greater ratings in Social Awareness and lower scores in Self-Management and Relationship Skills, the results showed that the student body had different levels of competency. The results show that in order to improve these competences, higher education must implement focused interventions. The implications of SEL assessments for curriculum development, educational

planning, and the integration of SEL-focused programs inside higher education institutions are covered in the study's conclusion. There are also suggestions for enhancing SEL measurement procedures and filling in existing assessment gaps.

Keywords: *Higher Education, levels of competency, Social Emotional Learning, questionnaire*

ICCI2025097: ENHANCING HOME SECURITY WITH IOT-ENABLED SMART INTRUDER DETECTION SYSTEM ON THE CLOUD

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ABSTRACT

A key element of home security is intruder detection. Cloud-based intruder detection systems are now a more effective and trustworthy choice thanks to the development of technology. In order to improve home security, this research article suggests the design and implementation of a smart intruder detection system on the cloud. The suggested system makes use of cloud-connected NodeMCU devices that are furnished with an IR sensor, buzzer, and LCD screen. Users can access the system using a web-based interface or mobile app because the system's cloud-based component offers remote monitoring and control capabilities. The interface enables remote system control and status viewing for the user. In comparison to traditional security systems, the cloud-based intruder detection system has a number of benefits, such as remote access to the system, real-time notifications in the event of a security breach, and compatibility with other smart home devices. The system can also be configured to notify emergency services in the event of a security breach. The research article also discusses the difficulties encountered in creating and implementing the system, as well as the solutions used to get beyond those difficulties. The report also offers the outcomes of testing the system's functionality, including its reliability of the cloud-based monitoring and control system and its accuracy in detecting intruders. Overall, this study shows how IoT-enabled smart intruder detection systems hosted on the cloud might improve home security. For homeowners seeking

sophisticated security features, the system offers a dependable, effective, and economical solution for protecting residential properties.

Keywords: *Cloud-based, Home security, Intruder detection, IoT, NodeMCU.*

ICCI2025098: A COMPARATIVE STUDY ON THE CLOUD-BASED LEARNING ENVIRONMENTS AND THEIR IMPACT IN REFORMING HIGHER EDUCATION PEDAGOGY

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ABSTRACT

This study intends to perform a comparative analysis of various cloud-based learning environments and their impact on reforming higher education pedagogy. By looking at important platforms like Google Classroom, Microsoft Teams for Education, Moodle, Canvas and Blackboard Learn, this research assesses their efficacy in improving student engagement, accessibility, and collaborative learning. The swift development of cloud technology has drastically changed the landscape of higher education by enabling creative and adaptable teaching-learning environments. The report also looks at the difficulties in integrating various technologies, such as infrastructure needs, digital literacy, and data security. Surveys and interviews with teachers, students, and administrators from a variety of academic institutions were used to collect both quantitative and qualitative data. The results demonstrate how interactive, learner-centric techniques and easy access to educational resources are two ways that cloud-based learning environments support pedagogical innovation. In order to support the continuous development of higher education in the digital era, this study ends with suggestions for maximizing the usage of cloud-based learning technologies.

Keywords: *Cloud-based platforms, pedagogical innovation, Teaching-Learning,*

ICCI2025099: A MACHINE LEARNING APPROACH TO RELIABLE STAGING OF ESOPHAGEAL CANCER: INSIGHTS AND OUTCOMES

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ABSTRACT

Esophageal cancer is a tough challenge, often diagnosed too late, which makes treatment harder and outcomes less certain. Getting the cancer's stage right is crucial for choosing the best treatment path. In this study, we explored how machine learning (ML) can help predict the stages of esophageal cancer more accurately. We worked with clinical and demographic data and tested various ML models, including Decision Trees, Random Forest, Neural Networks, and XGBoost. After cleaning the data and fine-tuning the models, we found that Decision Tree, Random Forest, and XGBoost nailed it, delivering perfect accuracy. These models show great promise in helping doctors make more reliable decisions, potentially improving care for patients with this challenging cancer. Our work highlights the growing role of ML in making cancer treatment more precise and effective.

Keywords: Esophageal Cancer, Machine Learning, Cancer Staging, Decision Tree, Random Forest, XGBoost, Neural Networks, Clinical Data, Predictive Modeling, Medical Diagnosis, Precision Medicine.

ICCI20250100: SMART INSOLE WEARABLE DEVICE FOR GAIT ANALYSIS IN PARKINSON DISEASE PATIENTS

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ABSTRACT

Parkinson's disease affects motor functions, with gait abnormalities being an early symptom. Traditional gait analysis methods are costly and limited to clinical settings. This paper presents a smart insole with Force Sensitive Resistor (FSR) sensors to monitor gait abnormalities in real-time. The wearable device tracks foot pressure distribution during walking and transmits data wirelessly for remote monitoring. This technology enables continuous tracking of

Parkinson's progression and supports personalized treatment plans, offering a practical solution for early detection and management of gait issues.

Keywords: Biomedical Signal Processing, Parkinson, wearable sensor, FSR, gait abnormalities.

ICCI20250101: DIGITAL TWIN IN MINING: PREDICTIVE AND RISK MITIGATION STRATEGIES

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ABSTRACT

Industries in India have experienced numerous fatalities, destructive incidents, and accidents due to a lack of awareness and insufficient research aimed at developing effective solutions. Documentaries from previous years have documented the troubling aspects of the cosmetic industry, where certain substances are marketed at the cost of numerous lives. While some sectors have begun to adopt digital twin technology, it has yet to achieve widespread implementation as a standard practice. The concept of the "Digital Twin," which refers to a Real-time digital representation of physical entities, serves as a valuable tool for predicting disasters and accidents. However, this effective approach is presently utilised only on a limited scale. Consequently, there is a pressing need to investigate the application of digital twin technology for significant social causes, emphasising both awareness and preparedness. In an era characterised by advanced technologies, innovative solutions for business sectors that jeopardise human lives can be achieved through the adoption of such techniques. This includes enhancing the accessibility and efficiency of Digital Twin Technology within the Mining Industry, as well as integrating Swarm Intelligence and Quantum Techniques into relevant studies. The objective of this study is to provide a comprehensive overview of the trade-off between profit and safety in the mining industry, while simultaneously improving Predictive Efficiency through the implementation of emerging technologies.

Keywords: Digital Twin Technology , Mining Industry, Predictive Efficiency, Swarm Intelligence, Quantum Techniques.

ICCI20250102: NAVIC: INDIA'S INDIGENOUS SATELLITE NAVIGATION SYSTEM

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ABSTRACT

With the increasing demand for accurate positioning and navigation, satellite-based systems have become an integral part of many sectors, including defense, transportation, and disaster management. NAVIC (Navigation with Indian Constellation) is India's independent regional satellite navigation system, developed by ISRO to provide accurate positioning services over India and neighboring regions. NavIC, created by the Indian Space Research Organization (ISRO), is made up of a ground control segment that oversees the system's operations and a constellation of seven satellites in orbit. An overview of NavIC's architecture, capabilities, and history is given in this document. The system is designed to be utilized for both civilian and military reasons, and it has numerous applications in a variety of industries, including transportation, agriculture, disaster management, and defense. This paper explores the architecture of NAVIC, its seven-satellite constellation, and the dual-frequency advantage that enhances its accuracy over single-frequency systems. It examines the applications of NAVIC in sectors like agriculture, marine navigation, and emergency response while addressing challenges such as signal interference and global interoperability. This paper presents the strategic importance and future potential of self-reliant navigation technologies by analyzing advancements in satellite navigation and comparing NAVIC with GPS and other GNSS.

Keywords: *NAVIC, Satellite Navigation, GNSS, Positioning Accuracy, Dual-Frequency Technology, RNS.*

ICCI20250103: EXPLORING THE APPLICATIONS OF QUANTUM COMPUTING

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ABSTRACT

Quantum Computing, using the principles of superposition, mess and quantum interference, represents a transformative paradigm in computational science. Unlike classical computers, which operates using binary states (0s & 1s), quantum computers utilize quantum bits(qubits) to process information exponentially faster for certain classes of problems In today's world, its application are beginning to emerge in areas such as Cryptography, where quantum algorithms can potentially break traditional encryption methods but also offer new, stronger encryption techniques. In healthcare, quantum computing aids in drug discovery by simulating molecular interaction with high precisions, accelerating the development of new treatments. The field of Artificial Intelligence(AI) benefits from quantum computing's ability to process large datasets and opting complex models more efficiently. This paper covers about the quantum computing models is Hardware, Quantum algorithms, Applications of Quantum, Current state of Quantum Computing and Future directions. The Objective of this paper is to inform, educate and demonstrate how quantum computing can be used to solve real-world problems that classical computing struggles with. And it explores more about explores the diverse applications of quantum computing across multiple domains, emphasizing its potential to solve complex problem previously deemed intractable.

Keywords: Qubits, Cryptography, Quantum algorithms, Quantum communication

ICCI20250104: A SURVEY OF TRANSFORMING DECISION-MAKING IN THE MODERN ERA WITH BUSINESS ANALYTICS

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ABSTRACT

Business analytics (BA) has become an essential tool for organizations looking to make data-driven decisions. Descriptive, diagnostic, predictive, and prescriptive methods are all included in business analytics and serve as essential components of strategic decision-making. Modern technologies like artificial intelligence, machine learning, and big data analytics allow businesses to uncover hidden patterns, get important insights, and predict future trends. The report examines its numerous applications in sectors including as manufacturing, healthcare, finance, and retail, emphasizing how it may improve customer satisfaction, operational efficiency, and profitability. Furthermore, it emphasizes shared difficulties, such as data integration problems, security risks, scalability challenges, and the increasing demand for data literacy among staff members. By converting unprocessed data into useful insights, data analytics assists companies in enhancing customer satisfaction, streamlining processes, and accomplishing their strategic goals. An example is given to demonstrate how analytics can connect raw data with actionable strategies. A novel contribution is the integration of STSs (business analytics, virtual business, and knowledge absorptive capacity) that drives business continuity innovation to deal and recover from uncertain environment. Our efforts also align several fields such as information technology-business alignment strategy, knowledge management, and knowledge-business services The paper wraps up by highlighting the crucial importance of Business Analytics in influencing contemporary businesses, promoting an innovative culture, and providing lasting competitive benefits in a world that is progressively driven by data.

Keyword: *Business Analytics, Artificial Intelligence, Technologies, Applications, Security.*

ICCI20250105: BRIDGING EDUCATIONAL GAPS: DEVELOPING PLATFORM FOR STUDENTS WITH LEARNING DIFFICULTIES

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ABSTRACT

Slow learners, students with below-average cognitive abilities, often struggle to adapt to conventional education systems that fail to accommodate their unique learning needs. Although advancements in educational technology have focused on students with specific learning disabilities, the challenges faced by slow learners remain largely unaddressed. This research proposes the development of an inclusive digital platform designed to support slow learners through personalized learning methodologies, interactive tools, and engaging content. The platform, accessible in both online and offline modes, integrates adaptive assessments, gamify learning experiences, and flexible study schedules to enhance motivation, comprehension, and academic success. Leveraging artificial intelligence (AI) and data analytics, the system identifies individual learning patterns, strengths, and areas requiring intervention, enabling a tailored approach to education. Grounded in cognitive load theory, self-paced learning, and assistive technologies, this initiative bridges the gap between general and specialized education systems, creating a supportive environment for slow learners. The research highlights the need for scalable, inclusive solutions that empower slow learners to thrive academically and reach their full potential. By addressing their specific needs, this platform aims to redefine educational accessibility and foster long-term success in an increasingly demanding academic landscape.

Keywords *:Slow learners, Learning difficulties, Personalized learning, Educational technology, Adaptive assessments, Gamified learning, Artificial intelligence, Inclusive education.*

ICCI20250106: CYBERCRIMES IN SYNTHETIC MEDIA: A MULTIDISCIPLINARY APPROACH FOR DETECTION AND CONTROL

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ABSTRACT

The rapid increase in synthetic media produced or manipulated by Artificial Intelligence such as deepfakes, AI crafted images or voices, marks the beginning of a new chapter in creativity and communication. While these technological advancements bring new possibilities and opportunities in fields like entertainment and education, they also bring forward many new problems. There is an increased risk of misuse of such technologies through activities like spreading of misinformation, identity theft and fake or AI generated content. The misuse of synthetic media can also lead to cybercrimes like evidence manipulation which may affect the proper delivery of justice in cases. All this emphasizes the necessity for stricter laws and effective rules to safeguard against such threats. This research focuses on the development of synthetic media and its impact on society and also the moral dilemmas it creates. It also demonstrates the importance of regulations to manage risks and promote advancements in this field. By providing innovative solutions to the challenges, this research aims to support a balanced approach that increases the benefits of synthetic media while limiting any negative consequences.

Keywords: synthetic media, cybercrimes, deepfakes, identity theft, technology, evidence manipulation, Artificial Intelligence

ICCI20250107: INTELLIGENT TUTORING SYSTEMS LEVERAGING COMPUTATIONAL INTELLIGENCE

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ABSTRACT

This paper explores the possibility of Intelligent Tutoring Systems (ITS) that incorporate computational intelligence to improve personalized learning experiences. The objective of this study is to determine how ITS can capitalize on artificial intelligence techniques, including machine learning and natural language processing, in order to effectively respond to individual needs of the students. It consists of a deep review of current ITS frameworks as well as integration of computational intelligence tools to test adaptive learning models. Key findings include the following: ITS integrating computational intelligence shows significant improvement in learning outcomes with the identification of knowledge gaps and provision of adaptive feedback. Its significance lies in advancing educational technology, fostering fair access to quality education, and paving the way for more effective learning environments.

Keywords: Intelligent Tutoring Systems (ITS), Machine learning, Natural language processing (NLP)

ICCI20250108: MACHINE LEARNING FOR STRESS PREDICTION: A STUDY ACROSS DIFFERENT AGE COHORTS

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ABSTRACT

The objective of this research is to determine the most stressed age group by analysing both behavioural data and subjective feedback across various age cohorts using machine learning techniques. This study integrates activity patterns e.g., physical moment, typing speed, mouse dynamics and interaction trends e.g., click frequency, screen time with self-reported stress levels collected via surveys and daily self-reports. Machine learning models will be engaged

to observe these behavioural variables, allowing for the identification of patterns and the connection between specific behaviours and perceived stress. The analysis commences with Supervised learning techniques like Random Forest and Logistic Regression to construct correlations between stress indicators and behavioural patterns. Clustering techniques such as K-Means are employed to classify participants with comparable stress behaviours, providing deeper insights into the difference among age groups. Over a week, data will be gathered to capture routine activities, and comparisons will be drawn across age groups to ascertain which group encounters major stress levels.

Keywords: *Predictive Modelling, Data Analysis, Clustering Techniques, Machine Learning, Stress Prediction, Behavioural Data, Subjective Feedback*

ICCI20250109: ANALYSIS OF MEDICAL IMAGES USING SOFT COMPUTING TECHNIQUES

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ABSTRACT

The field of Medical image processing is one of the widely used and rapidly growing areas of research. It is widely used to diagnose diseases in the medical field. It will be useful to treat the patient better. Soft computing techniques draw the attention of researchers because of their flexibility to work with ownership functions. They are very adaptive in nature, and hence they are the most preferred by researchers and developers. Their advantages are tolerance towards imprecision, approximation, and uncertainty. AI deals with exhibiting human intelligence on machines. Machine learning helps to achieve artificial intelligence. Deep learning helps to implement the machine learning. Goal of this research is to understand various research done in medical image processing domain. We focused primarily on the application of the classification as well as tbe segmentation methods in the field of medical imaging. With technology growth in the field of medical science along with the growth of soft computing techniques, researchers have carried out various experiments in recent years and published their significant research findings. It is proposed to use a brain image data set as well as a retinal image data set for the experiment. The experiment results will be analyzed with respect to some

performance measures to make them more suitable for medical analysis, predictions, and other applications.

Keywords: Machine learning, Artificial Neural Networks, Deep Learning, Convolutional Neural Networks, Brain Tumor Detection, Unsupervised Learning, Supervised Learning

ICCI20250110: THE HUMAN TOUCH IN DIGITAL SPACE

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ABSTRACT

Artificial intelligence (AI) has become one of the most impactful technologies in today's world, transforming the way humans and machines interact. These systems are designed to feel more genuine and relatable, mimicking human behavior in ways that enhance our connection to technology. This paper explores the idea of integrating the human brain with digital technologies, focusing on how innovations like augmented reality (AR) and virtual reality (VR) can bridge the gap between the physical and digital worlds. These technologies offer immersive and collaborative experiences that redefine how we perceive and interact with the digital space. Our main objective is to understand how advancements in AI and digital tools can work alongside the human brain, creating a seamless relationship between human cognition and machines. Alongside these developments, we are committed to ensuring that these technologies are used responsibly protecting privacy, minimizing bias, and fostering trust. By adding a human touch to digital environments, technology can become more than just a tool. It can evolve into a platform that supports meaningful connections, deeper understanding, and emotional well-being, creating a future where humans and machines work in harmony.

Keywords : Augmented reality, virtual reality, human cognition and machines, human touch to digital environments, deeper understanding.

ICCI20250111: DIABETIC FOOT ULCER IMAGE SEGMENTATION FOR WOUND DETECTION USING WAVELET TRANSFORM

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ABSTRACT

A diabetic foot ulcer (DFU) is an open sore at the bottom of the feet caused by infection, abnormal pressure on the foot, diabetic mellitus, or diabetic neuropathy. Proper treatment can prevent limb amputation triggered by DFU. Studying the diabetic foot image is significant as it contributes to the diagnosis of DFU conditions, just like other medical images. Medical image segmentation plays a crucial role in diabetic foot ulcer image analysis. To address this issue, image segmentation using wavelets is a key solution to studying the DFU stage. This work involves DFU image segmentation and evaluates the wound percentage by comparing it with the healthy foot image. The proposed method outcomes with improved performance in terms of sensitivity, PSNR, and SSI.

Keywords: DFU image, segmentation, Wavelets.

ICCI20250112: TRANSFORMING FRAUD DETECTION SYSTEMS WITH AI AND ML: A REVIEW OF CURRENT TRENDS AND CHALLENGES

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ABSTRACT

This review paper explores the transformative impact of Artificial Intelligence (AI) and Machine Learning (ML) on fraud detection systems, highlighting the limitations of traditional rule-based approaches and the advantages of modern AI-driven methodologies. As fraud tactics evolve in complexity, traditional systems struggle to keep pace, often resulting in high false positive rates and an inability to detect novel fraud patterns. This paper discusses the various types of fraud, including financial fraud, identity theft, corporate fraud, and internet fraud, and examines the strategies employed by fraudsters. We detail the processes involved in AI and ML-based fraud detection, including data collection, preprocessing, model selection, training,

evaluation, deployment, and post-deployment monitoring. The paper emphasizes the importance of adaptability, scalability, and precision in AI/ML systems, which enable organizations to effectively combat sophisticated fraud schemes. Additionally, we address the challenges of data privacy, model explainability, and the need for continuous improvement in fraud detection systems. By integrating AI and ML into fraud detection strategies, organizations can enhance their ability to prevent financial losses and protect customer interests in an increasingly digital landscape. This review serves as a comprehensive resource for understanding the current state and future directions of AI and ML applications in fraud detection.

Keywords: Artificial Intelligence, Machine Learning, Financial Fraud, Identity theft, Corporate fraud, Internet fraud, Detection , Cybersecurity, Supervised Learning, Unsupervised Learning, Algorithms, Data Collection, Preprocessing, Model Selection, Training, Evaluation, Deployment, Post-Deployment, Traditional Systems.

ICCI20250113: PRIVACY PARADOX

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ABSTRACT

The notion of privacy has been contradictory for ages, especially in the digital age where media and digital lifestyles have impacted individual's perception of privacy. The study is conducted in a well-defined manner. The emphasis of the research based on how individuals perceive privacy and their awareness of digital security. The subject was tested on their technology-related knowledge and was asked to talk about his/her perspective on privacy which was filmed. All the information gathered is formatted for further research on such topics. Various subjects' technical skills were thoroughly tested via Google Forms. The data collected was used to analyse technical proficiency and privacy awareness trends. Additionally participant's responses were examined to identify patterns in how individuals perceive and prioritise digital security. The recorded discussions provided qualitative insights, helping to understand personal attitudes toward privacy in a real-time. The formatted data will be used for further research, allowing comparisons between technical expertise and privacy concerns across different demographics. Several review papers were examined which furnished the relevancy of privacy concerns of the third-party data consumers. We also made an effort to gather information about ourselves from the data acquirers to understand the depth of vulnerability that people are

exposed to in the current digital world. Many attack vectors were analyzed to understand the vulnerabilities and risks associated with compromising the consumer's data in the present digital era. The misappreciation of AI to create tools using technologies like deepfake can easily manipulate personal data and generate highly convincing yet fabricated content, which compromises both individual privacy and public trust. Our analysis highlighted how attackers use such AI-driven techniques to breach security systems, steal identities, and spread misinformation.

Keywords: Privacy, cryptography, Data Acquirers, Perpetrator

ICCI20250114: AI-BASED FOOD RECOMMENDATION AND CALORIE ESTIMATION FOR PERSONALIZED DIET PLANNING USING CNN

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ABSTRACT

In today's fast-paced lifestyle, maintaining a healthy diet and managing calorie intake have become essential for overall well-being. This project focuses on developing an intelligent food recommendation and calorie estimation system using machine learning techniques, specifically leveraging Convolutional Neural Networks (CNN). The proposed system analyzes food images and ingredient details to estimate caloric values accurately and provide personalized diet plans based on individual health conditions, preferences, and nutritional needs. CNN is utilized for efficient food classification and calorie prediction, ensuring precise dietary recommendations. The system incorporates user-specific data such as age, weight, height, and dietary restrictions to generate optimized meal plans tailored to health goals like weight loss, muscle gain, or balanced nutrition. By integrating a machine learning-based predictive approach, this model enhances user engagement and adherence to a healthier lifestyle. The implementation of this system contributes to digital healthcare solutions by offering automated, real-time diet planning and nutritional monitoring, thereby improving dietary habits and promoting overall well-being.

Keywords: *Food Recommendation, Calorie Estimation, Personal Diet Planning, Machine Learning, Convolutional Neural Networks (CNN), Nutritional Analysis, Automated Diet Planning, Food Image Recognition,*

ICCI20250115: PRIORITIZATION OF DISEASE CANDIDATE METABOLITES THROUGH ADAPTIVE CUCKOO SEARCH ALGORITHM

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ABSTRACT

To determine which disease-related metabolites are strongly associated with the corresponding disease. The Existing methods InfDisSim, SLWBMISM, MPN-SLWBMISM identified enormous amount of disease related metabolites. Even though it identified enormous metabolites it is essential to extract the high prioritized metabolites towards the disease to study about the complex diseases and to develop the drug. To achieve this Adaptive Cuckoo Search Algorithm (ACSA) has been proposed in this research work. The equilibrium between local and global random walks could not be maintained by the Random Walk algorithm that was in use at the time. In order to successfully maintain a balanced link between local and global random walks using switching parameters, this method makes use of the Cuckoo Search Algorithm (CSA). However, this algorithm's switching value is fixed and insufficiently valid to evaluate how a dynamic switching parameter affects CSA performance. In order to address the aforementioned issue, this study presented an improved and optimized random walk method known as the adaptive cuckoo search algorithm (ACSA), which is used to rank disease-related candidate metabolites based on scores by dynamically adjusting switching parameters. By improving the connectivity between metabolites linked to the same disease as well as for diseases whose metabolites belonged to different pathways, ACSA contributes to increased efficiency. The key metabolites that are closely linked to the particular medical condition were extracted using the suggested method in comparison to the current approaches. The suggested approach produced a recall rate of 96.7% and a precision of 97.5%.

Keywords: *Subcellular Localization, Metabolic Pathway Network, Random Walk Algorithm, Cuckoo Search Algorithm, Switching Parameters.*

ICCI20250116: ENHANCING SECURITY IN PUBLIC KEY ALGORITHMS USING SCRZE APPROACH

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ABSTRACT

The efficiency of any cryptographic algorithm depends on the operational speed and how it produces the ciphertext from the plaintext. Several symmetric and public key algorithms are available to create a ciphertext from a plaintext. Still, in all algorithms, the corresponding positional value or the ASCII value is considered in the encryption. The main drawback of this encoding scheme is that if a character occurs at several places of plaintext, the same ciphertext character will always be produced. Hence, the eavesdropper may recover plaintext from the ciphertext by identifying the relationship between plaintext and ciphertext. To overcome this, a novel method has been proposed in this paper using SCRZE (Spiral Clockwise Rotation Zigzag Encryption) approach. The sequence of bits obtained from this method is converted into blocks by considering the values of p and q, which are mainly involved in determining the key value of any public key algorithm. As p and q values are changed, the size of the block is also changed, which in turn changes the size of the key, and it may produce different ciphertext for the same plaintext, which enhances security.

Keywords- SCRZE, Public Key Cryptosystem, RSA, Securit

ICCI20250117: THE ROLE OF AI IN WEB DEVELOPMENT: TRANSFORMING USER EXPERIENCE AND AUTOMATION WITH AI-POWERED TOOLS

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ABSTRACT

Artificial Intelligence (AI) is fundamentally transforming web development by improving userb experiences and optimizing automation processes. This paper investigates the significant influence of AI-driven tools in the creation of intuitive, personalized, and engaging web interfaces. Utilizing technologies such as predictive analytics, natural language processing,

chatbots, and recommendation systems, AI solutions empower developers to better meet user requirements. Additionally, automation in coding, design enhancement, and content creation expedites development timelines while minimizing human error. Through an analysis of essential technologies and practical applications, this study underscores the role of AI in shaping the future of web development, rendering it more efficient, innovative, and focused on user needs. Through the integration of machine learning, developers can continuously enhance web performance and user engagement by analysing insights derived from user behaviour. This study highlights the critical technologies and practical applications of AI, emphasizing its role in transforming web development into a more efficient, innovative, and user-centric discipline.

Keywords: *Artificial Intelligence, Web Development, User Experience, Automation, Chat Box, Content Creation, AI Driven Tools*

ICCI20250118: ENHANCING PULMONARY EDEMA DETECTION IN CHEST X-RAYS: GAN BASED DATA AUGMENTATION AND INTERPRETABLE REGION HIGHLIGHTING

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ABSTRACT

Pulmonary edema is a dangerous condition that involves the buildup of fluid in t lungs, which can lead to severe respiratory difficulties if not identified early. In this p we provide a unique strategy to enhance the identification of pulmonary edema utilizi a mix of Generative Adversarial Networks (GANs) and Gradient-weighted Class Activation Mapping (Grad-CAM). The suggested strategy leverages GAN-based data augmentation, leveraging Focal Tversky Loss, to handle the difficulty of limited annotated medical pictures, he increasing the model's generalization capabilities. Grad-CAM is applied to highlight the regions of interest within Chest X-rays (CXR), giving interpretability and supporting doctors in better comprehending the model's predictions. Our results reveal that the GAN-augmented dataset greatly boosts the model's performance, with improved accuracy, precision, and recall compared to standard augmentation strategies. The device also delivers visual explanations, which can assist radiologists in making more educated decisions. The coupling of GANs for data augmentation with Grad-CAM for explainability gives a robust approach for pulmonary edema identification, with potential applications in both medical imaging domains.

Keywords: *Generative Adversarial Networks (GANs), annotated, Focal Tversky Loss, medical imaging*

ICCI2025119: A STUDY ON PNEUMONIA DETECTION USING CNN AND A COMPARATIVE ANALYSIS OF VGG16 AND VGG19

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ABSTRACT

Pneumonia is an infection caused by bacteria, viruses, or fungi that impairs respiratory function by inflaming and swelling the air sacs in the lungs resulting in fluid or pus and mucus filling. Traditionally, pneumonia detection is conducted using chest X-ray images. This study explores the use of Convolutional Neural Networks for detecting pneumonia through X-ray images. The approach leverages deep learning to develop a model that can accurately distinguish between patients affected and unaffected by the disease using chest Xrays. By training on a larger set of images than any human doctor could, the CNN model has the potential to achieve higher accuracy in detecting pneumonia. This paper also conducts a comparative analysis of VGG16 and VGG19.

Keywords: Deep Learning, Convolutional Neural Network, VGG16 and VGG19

ICCI2025120: BUILDING A DOM PARSER FOR JSON: A STUDY ON TECHNIQUES FOR IMPROVING PERFORMANCE

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ABSTRACT

JavaScript Object Notation (JSON) is a text-based data interchange format widely used for communicating data over the web. Considerable amount of time is spent by applications in parsing JSON documents before it can make use of the data, thus leaving scope for improvement in performance. Parsing includes syntax validation, character-encoding validation, and creating an in-memory representation of the data. Document Object Model approach for parsing particularly takes time as the entire JSON document needs to be represented as a data structure in memory. simdjson, sajson, and yyjson are some of the fastest

JSON parsers currently available in the industry that use the DOM approach for parsing. This paper studies different performance optimization techniques like vectorization, avoiding branch mispredictions, efficient memory allocation, and compiler optimizations used in these parsers along with their limitations. The study also includes comparison of overall performance of these parsers and the time taken to query the in-memory data structure built by it.

Keywords: JSON Parsing, DOM Parser, SIMD, Performance optimization.

ICCI2025121: EVALUATING THE PERFORMANCE OF DATA MINING ALGORITHMS FOR MARKET BASKET ANALYSIS

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ABSTRACT

Data mining is extracting and analyzing information from a massive dataset. This research aims to explore Market Basket Analysis (MBA), an application of data mining technique to demonstrate data extraction. MBA is used to identify the customer purchasing pattern by discovering associations among the products placed in their shopping cart, using Association Rule Mining (ARM). ARM is used to identify the relation between each item set and the frequent patterns can be found by utilizing its algorithms such as Apriori and FP growth. This research evaluates the performance of the algorithms based on their efficiency, memory requirements, and scalability, and aims to understand how data mining techniques reveal hidden relationships in large datasets. This comparative analysis found that the FP growth algorithm works better than the Apriori algorithm.

Keywords: Data mining, Market Basket Analysis(MBA), Association rule mining(ARM), Apriori, FP growth.

ICCI2025122: A COMPARATIVE STUDY OF OBJECT DETECTION ALGORITHMS IN COMPUTER VISION: YOLO, SSD, AND FASTER R-CNN

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ABSTRACT

In the field of computer vision, object detection plays a crucial role in various applications such as autonomous driving, surveillance, and image recognition. This research aims to compare selected object detection algorithms to identify the most effective one for implementation. The study will focus on widely used algorithms like YOLO (You Only Look Once), SSD (Single Shot MultiBox Detector), and Faster R-CNN (Region-based Convolutional Neural Networks). By evaluating these algorithms based on criteria such as accuracy, speed, computational requirements, and ease of implementation, this paper will provide a comprehensive understanding of their performance in diverse scenarios. Utilising standard datasets and existing benchmarks, the research will offer practical insights and guide practitioners in selecting the optimal algorithm for their specific needs in implementation, ultimately enhancing the efficiency and reliability of object detection systems.

Keywords: Object Detection,YOLO, SSD, Faster R-CNN, Accuracy , Speed, Computer Vision.

ICCI2025123: A REVIEW ON PREDICTING CARDIOVASCULAR DISEASE USING ECG

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ABSTRACT

Heart diseases remain one of the leading causes of mortality worldwide, affecting individuals across all age group. Reducing the total death rate linked to cardiovascular illnesses requires early detection of these problems. Heart failure, atrial fibrillation, and bradycardia are a few of the many cardiovascular disorders that can be accurately predicted by using artificial

intelligence to the study of Electrocardiogram (ECG) signals. The goal of this project is to create a real-time prediction tool that fits easily into the current healthcare infrastructure. With the help of this machine learning model, heart disease diagnoses can be made early through the use of sophisticated machine learning methods, specifically Convolutional Neural Networks, to improve the accuracy of disease detection and risk assessment. By reducing the need for more involved therapies linked to advanced heart diseases, the use of this predictive technology could result in a decrease in healthcare expenses. The study contributes to the continuing progress in this field by examining the potential of AI and machine learning in ECG analysis in the early diagnosis of cardiovascular illness, promoting a medical setting that places a high priority on proactive care.

Keywords: Cardiovascular Disease, ECG, Machine Learning, CNN, AI, ECG Signal Analysis

ICCI2025124: LEVERAGING FILM ANALYTICS TO FORECAST BOX OFFICE REVENUE

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ABSTRACT

Screening of a movie before it is released is significant in the film industry, especially with production, marketing management, and distribution. This study analyzes such a scenario by applying different machine learning algorithms in predicting box office performance by rationalizing various key features. The features in question include genre, budget, cast, director, film length, release date and time, reviews, social media activity, advertisements, etc. By doing so we will have the opportunity to observe which of the methodologies is productive and applies to accurate predictions with real payloads. This research points out that a successful box office prediction needs to be based not on one-dimensional but rather on multiple forms of data. These results offer useful help to filmmakers, film producers, and film marketers, enabling faster decisions and plans created for optimum movie performance at the box office.

Keywords: Box office prediction, machine learning, film industry, marketing, distribution, genre, budget, cast, director, data analysis.

ICCI2025125: HAND GESTURE RECOGNITION FOR HUMAN-COMPUTER INTERACTION: A DEEP
Learning Approach

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ABSTRACT

In today's digital world, communication became one of the important aspects for human life. But even today most of the people with hearing and deaf problems, faces difficulty in expressing themselves and understanding their thoughts to others. This research focuses on collecting dataset of different hand gestures and perform operations on it using deep learning. Hand gesture recognition is helpful in this mode of communication. It will significantly reduce the difficulties in communicating the people with sign languages. This study involves pre-processing the dataset and use approaches like CNN (Convolutional Neural Network) and DBN (Deep Belief Networks) is involved to recognize dynamic hand gestures recorded in a realistic environment. In order to strengthen the models' resilience and improve their ability to generalize across a variety of sign languages and gesture variations, the study also investigates data augmentation strategies. This work reduces the communication hurdles that the hearing-impaired community faces by advancing the field of gesture recognition and potentially benefiting virtual reality, human-computer interaction, and numerous assistive devices.

Keywords: Hand gesture recognition, Deep learning, Convolutional Neural Network (CNN), Deep Belief Networks (DBN), Data augmentation, Gesture variation.

ICCI2025126: A COMPREHENSIVE SURVEY ON NEURAL STYLE TRANSFER: TECHNIQUES AND APPLICATIONS

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ABSTRACT

Neural Style Transfer technology has seen significant growth and application across diverse fields—from art and photography, where it enables unique stylistic creations, to video games, where it generates new visual textures, and fashion, where it assists designers in crafting novel styles. This advanced technology in deep learning and computer vision creates a stylized image by merging content and style images. Convolutional Neural Networks are employed to extract features from these images, combining them to produce a new, stylized result. Over time, Neural Style Transfer has also integrated Generative Adversarial Networks to enhance the quality of style transfer. This research explores prominent algorithms in Neural Style Transfer, including Convolutional Neural Networks, Adaptive Instance Normalization, Dynamic Residual Blocks with Generative Adversarial Networks, and the Segment Anything Model. Algorithms for Neural Style Transfer were evaluated on metrics like structural similarity and processing efficiency, with results analyzed, revealing that the Dynamic Residual Blocks with Generative Adversarial Networks methods excel over other approaches. Future work will concentrate on areas such as multi-style transfer, real-time processing, and 3D segmentation-based style transfer.

Keywords: Style Transfer, convolutional neural networks, video style transfer, generative adversarial networks, Segment Anything Model

ICCI2025127: DETECTING DEEPFAKES USING MULTI-TASK CASCADED CONVOLUTIONAL NETWORKS (MTCNN) AND THE XCEPTION MODEL

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ABSTRACT

The study provides a detailed examination of deepfake detection methods, particularly focusing on the use of Multi-task Cascaded Convolutional Networks (MTCNN) for face detection and the Xception model for feature extraction. MTCNN is highly effective in detecting facial landmarks, even in complex scenarios, which is a crucial step in isolating faces for further analysis. The Xception model, with its advanced feature extraction capabilities, helps identify subtle pixel-level inconsistencies introduced by deepfake techniques, such as unnatural lighting or facial textures. Together, these models offer robust solutions for detecting deepfakes, but they also face limitations, such as difficulty in handling extreme facial poses or high computational costs, which can hinder real-time performance. The paper also explores real-world applications of these models, emphasizing their potential to safeguard media integrity by verifying the authenticity of images and videos before publication, and to ensure legal evidence remains credible in courtrooms. Furthermore, it suggests future research directions, such as the integration of temporal analysis to detect inconsistencies across video frames and the development of more efficient, lightweight detection models that can be deployed on everyday devices like smartphones. These innovations would allow for more scalable, accessible deepfake detection solutions, ensuring a broader impact across industries such as journalism, cybersecurity, and national security.

Keywords: *Deepfake detection, Multi-task Cascaded Convolutional Networks (MTCNN), Xception, Face detection, Media authenticity, Temporal Analysis*

ICCI2025128: AN ENHANCED APPROACH TO PREDICT SOFTWARE FAULTS USING DEEP LEARNING TECHNIQUES

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ABSTRACT

Fault detection in software plays a vital role in software testing, significantly cutting down the time and resources needed to find defects. This paper introduces a model designed to enhance defect identification across different software units, thus reducing testing time and identifying areas that are more prone to defects. This two-stage model predicts number of errors using algorithms that have been fine-tuned through iterative parameter adjustments to ensure high accuracy and then refines these predictions by combining the predictive accuracy of individual classifiers through a voting ensemble system for defect prediction. This work utilises deep neural networks, including convolutional neural networks and multi-layer perceptrons, to effectively predict the number of errors. Furthermore, the paper includes a comparative analysis of this approach with other machine learning models, showcasing its benefits in defect prediction.

Keywords: software testing, fault detection, defects, deep learning, machine learning

ICCI2025129: FROM SKETCH TO COLOR: A DEEP LEARNING FRAMEWORK FOR EFFICIENT CARTOON COLORIZATION

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ABSTRACT

Colorization of a sketch image has greatly improved with the advancement of deep learning technology, mostly due to the invention of GANs and convolution models. This paper is a progression of the Automatic Cartoon Colorization Network since it is among the best

strategies for implementing automatic cartoon colorization using cGAN: self-attention mechanisms, edgepreserving smoothing, and color correction. The paper examines the effectiveness of segmentation in guiding colorization by drawing various approaches that exist up to the present, from stylized outputs combined with a palette GAN model to improved consistency using reference-guided frameworks. Further, the paper discusses the evolution from traditional methods to modern paradigms of deep learning, including the role of semantic segmentation in the outcome. This paper embodies improvement in automatic image colorization. It focuses on the limitations that persist in colorization, such as achieving semantic accuracy and artistic intent, which are very important for application in digital art and animation. This approach offered a very efficient solution to automatic cartoon colorization and considerably reduced time and human work usually required in the colorization process while presenting high-quality results.

Keywords: *Generative Adversarial Networks (GANs), Segmentation, cGAN, self-attention mechanisms, edge-preserving smoothing and color correction*

ICCI2025130: PREDICTIVE ANALYTICS FOR CHRONIC KIDNEY DISEASE: A COMPREHENSIVE SURVEY OF MACHINE LEARNING TECHNIQUES

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ABSTRACT

Chronic kidney disease (CKD) is a progressive condition that leads to a gradual decline in kidney function. Without appropriate treatment, CKD can progress to kidney failure, which significantly reduces life expectancy and often necessitates a kidney transplant as a critical intervention. Early detection of CKD is vital, as prompt diagnosis can be life-saving. Machine learning techniques offer powerful methods for predicting CKD. This paper outlines a systematic approach that encompasses data preprocessing, feature selection, and collaborative filtering to handle missing values, all aimed at forecasting CKD status using clinical data. The study employs a variety of classifiers and data transformation techniques to enhance predictive accuracy and support the early identification of patients at risk. Specifically, this work investigates the performance of various traditional and emerging machine learning models such as Decision Trees, Support Vector Machines, Random Forest, Neural Networks, Deep Learning and Explainable AI on the basis of its accuracy, preciseness and execution time for CKD

prediction. This study also underscores the significant role of machine learning in improving healthcare strategies and outcomes.

Keywords: Kidney Disease Prediction, Decision Tree, Support Vector Machine, Random Forest classifier, Explainable AI, Deep Learning.

ICCI2025131: ENHANCING STOCK PRICE PREDICTION WITH ATTENTION MECHANISMS IN DEEP LEARNING MODELS

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ABSTRACT

The technique of analyzing and estimating a company's stock price using past data is known as stock price prediction. It is among the fields of research that is most active right now. Stock market investing carries a certain amount of risk, and making predictions can be difficult. Investors can use stock price prediction to assist them make financial decisions about which stocks to buy or sell. To help with making the best choice in the stock market, a variety of machine learning and deep learning algorithms are introduced. whereas temporal dependencies are frequently difficult to capture using the conventional method. The ability of deep learning models to forecast stock values, such as long short-term memory (LSTM) networks, recurrent neural networks (RNN), and convolutional neural networks (CNN). This work concentrates on LSTM in conjunction with the sliding window method, which is employed due to its effectiveness in addressing the long-term dependency issues that conventional RNNs cannot handle. In comparison to other models such as CNN and RNN, the effectiveness of utilizing the LSTM model in conjunction with the sliding window technique for stock price prediction is evaluated. Evaluation metrics such as root mean square error (RMSE) and mean squared error (MSE) will be used to determine the algorithm's efficiency. The results imply that the sliding window method and LSTM together improve prediction accuracy and offer a more useful tool for financial decision-making.

Keywords: stock price, Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), and Long Short-Term Memory (LSTM), Sliding Window Approach, Mean Squared Error (MSE) and Root Mean Squared Error (RMSE).

ICCI2025132: A COMPARATIVE ANALYSIS USING DEEP LEARNING TECHNIQUES FOR DETECTING LUNG CANCER

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ABSTRACT

Convolutional neural networks are a specialised type of deep learning model tailored for handling grid-like data, particularly images. It is now being used in various applications, including image classification, object detection, and segmentation, because they automatically detect patterns in images by learning spatial hierarchies of features. Recently, CNNs have made significant development in the healthcare sector, especially in analysing medical images and visual data. A key application is the detection of lung cancer, which arises from the uncontrolled growth of abnormal cells in the lungs. Early detection of lung cancer using CNNs involves employing advanced techniques to spot cancerous patterns in medical images. This paper evaluates three well-known CNNs architectures, VGG-16, ResNet-50, and DenseNet-12[1] to identify the effective model for real-time lung cancer detection. The analysis aims to explore the stages of lung cancer detection in distinguishing between cancerous and non-cancerous data from CT scans, providing valuable insights into the efficacy of each method for early disease detection.

Keywords: *Deep Learning, Convolutional Neural Networks, Computer Vision, VGG-16, DenseNet-121, ResNet-50*

ICCI2025133: PREDICTION BASED ANALYSIS ON CREDIT CARD FRAUD DETECTION USING DEEP LEARNING TECHNIQUE

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ABSTRACT

As the number of digital transactions rises, credit card fraud detection has grown more crucial since it puts both customers and institutions at serious financial risk. In particular, deep learning algorithms like Convolutional Neural Networks and Long Short-Term Memory networks are used in this study to detect fraudulent credit card transactions. The model looks for abnormalities suggestive of fraud by examining patterns in transactional data. Real- time fraud detection is made possible by the suggested system's ability to learn from past data and distinguish between suspicious and genuine activity. By lowering the possibility of fraudulent credit card use and increasing customer trust, this strategy contributes to the improvement of financial transaction security. By lowering the possibility of fraudulent credit card use and boosting customer confidence, the suggested strategy seeks to improve the security of financial transactions. Providing a more secure financial environment and protecting digital payments are important goals achieved with this deep learning-based methodology.

Keywords: Recall, accuracy, precision, and false positive rate are used to assess the model's efficacy.

ICCI2025134: SURVEY ON RETINAL DISEASE CLASSIFICATION FROM OPTICAL COHERENCE TOMOGRAPHY (OCT) USING DEEP LEARNING TECHNIQUES

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ABSTRACT

The most prevalent cause of blindness is retinal disorders. Numerous disorders have been found; some are caused by genes that are inherited, while others are brought on by progressive retinal damage. As a result, it is a crucial modality for identifying disorders and anomalies of the retina. For each patient, OCT produces several pictures, therefore ophthalmologists must spend a lot of time analyzing the data. The imaging technique known as optical coherence tomography (OCT) creates an image of the retina, the back of your eye. The quantity of dim red light that reflects the retina and optic nerve is measured in a picture is created by this non-invasive technique. Alexnet, Resnet50, and InceptionV3 among other deep learning approaches, are used to forecast retinal disorders by classifying patients' OCT pictures into four groups: Normal, Diabetic macular edema (DME), Drusen, Choroidal neovascularization (CNV), and Drusen. In this paper, performances of several approaches are compared using measures such as accuracy, specificity and sensitivity.

Keywords: *Deep learning, Optical coherence tomography, Alexnet, Resnet50, InceptionV3, CNV, DME, Drusen.*

ICCI2024135: OPINION MINING ON PRODUCT REVIEW USING MACHINE LEARNING

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ABSTRACT

With the rise of online services, understanding customer feedback through opinion mining, or sentiment analysis, has become crucial for driving business growth. The sheer volume of content generated by consumers presents challenges for companies trying to accurately

interpret the feedback. By identifying whether reviews convey positive or negative sentiments, businesses can extract actionable, data-driven insights into public opinion, helping customers make informed purchasing choices. This study investigates the use of machine learning algorithms, such as Naive Bayes, Support Vector Machines (SVM), K-Nearest Neighbors (KNN), Random Forest, CatBoost, Logistic Regression, and ensemble models, for effective sentiment classification. It also examines how different preprocessing and feature extraction techniques impact the performance of these models. This study highlights the significant role of sentiment analysis to improve business strategies, enhance marketing efforts, and build stronger relationships with customers.

Keyword: Customer Feedback, Sentiment Analysis, Opinion Mining, Machine Learning Algorithms, Naive Bayes

ICCI2024136: FAKE NEWS DETECTION USING ALGORITHMS OF MACHINE LEARNING

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ABSTRACT

In recent years, there has been an upsurge in the study of the classification of fake news on social media platforms due to numerous instances of misrepresentation of information on the web. The emergence of new communicational models and social policies has outgrown the implementation of counter essays or even the collection of evidence minimizing the dissemination of false pictures. This work is oriented toward Information Technology and Machine Learning in recognition of fake news where Logistic Regression, Naïve Bayes, and Decision SVM algorithms are explored in detail. The data collected was 1.37 million tweets regarding the COVID-19 phenomena. The findings in the study reveal that SVM model was able to achieve the highest accuracy at 98% compared to other algorithms. This study puts into perspective the practicality of machine learning techniques in large-scale sentiment analysis and more importantly, fake news detection, with a focus on SVM.

Keywords: Fake News Detection, Social Media, Machine Learning, Support Vector Machine (SVM), Logistic Regression, Naive Bayes, COVID-19 Misinformation, Twitter Dataset.

ICCI2025137: STUDY ON SKIN CANCER DETECTION USING DEEP LEARNING

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ABSTRACT

The objective of this research is to build a skin cancer detection model using convolutional neural networks (CNNs), which are well-known for their effectiveness in picture classification tasks. In order to maximize performance, the model will look at different CNN designs that use convolutional, dropout, pooling, and dense layers. Techniques for Transfer Learning will also be used to improve accuracy and speed up training. The model will be trained and assessed using dermoscopic images of diverse skin lesions from the International Skin Imaging Collaboration (ISIC) dataset. Classifying skin cancer forms which comprise melanoma and non-melanoma, the worst kind that accounts for about 75% of skin cancer-related deaths is the main objective. Automated detection can help healthcare professionals by providing quicker, more accurate diagnoses. Increased survival rates necessitate early identification.

Keywords: *Skin Cancer, Medical image processing, Deep Learning, CNN, VGG16, DenseNet*

ICCI2025138: A COMPARATIVE STUDY ON BLENDING REALISM IN IMAGES WITH GENERATIVE ADVERSARIAL NETWORK ARCHITECTURES

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ABSTRACT

Generative Adversarial Networks (GANs) have emerged as the most powerful tool in deep learning. One of the important applications of GANs is realistic image synthesis, which transforms the resolution of the images from low to high and pushes the boundaries of computer graphics, style transferring, and image synthesis. GAN architecture plays a major role in creating realistic visuals for film, video games, and animation. This study explores the underlying architectures that enables high-resolution image generation, including techniques like Enhanced Super-Resolution GANs (ESRGANs), Super-Resolution GANs (SRGAN) and

Progressive Growing GANs (PGGANs) which have shown great success in producing detailed and realistic images. Focusing on the specific requirements such as complex textures, character realism and perceptual quality, this survey explains the capacity of these GAN Models and performance comparison. By doing a comprehensive study on this GAN methodology, this survey provides understanding of the transformative effect of GANs with different architectures on creating high-resolution, realistic images for next-generation gaming and computer graphics.

Keywords: Deep Learning, Generative Adversarial Networks (GANs), Image Super-Resolution, GAN Architectures, Perceptual quality.

ICCI2025139: A STUDY ON DEEP LEARNING APPROACHES FOR BONE CANCER DETECTION

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ABSTRACT

Bone cancer is a rare yet aggressive condition characterized by the uncontrolled growth of abnormal cells within the bone. Due to its relatively low incidence and often subtle early symptoms, it is frequently diagnosed in its later stages, making effective treatment and intervention more challenging. Timely detection of bone cancer is crucial for improving patient outcomes, as early treatment can prevent the spread of the disease and increase the chances of successful management. Traditional diagnostic methods, such as physical examinations, biopsies, and manual image analysis, can be limited in their ability to identify bone cancer early. As a result, there is a growing need for more advanced, automated approaches to aid in the early detection and classification of bone tumors. In this paper, we propose a deep learning-based solution to address this challenge, using Convolutional Neural Networks (CNNs) and Residual Networks (ResNet) to process and analyse medical imaging data, including MRIs, CT scans, and X-rays. These deep learning models are trained to recognize specific patterns and features indicative of bone cancer. The CNNs are particularly effective in learning spatial hierarchies from medical images, while ResNet, with its residual connections, improves the model's ability to handle very deep architectures without losing critical information. This deep

learning approach can detect subtle differences in bone structure and tissue anomalies that might be missed by human experts, providing a more robust and accurate analysis of medical scans. The ability to track the progression of bone cancer over time using these models adds another layer of insight, as it helps in understanding how the disease evolves and spreads. The models not only help in identifying whether a tumor is malignant or benign, but also classify the type of bone cancer, providing crucial information that can guide treatment decisions. By leveraging these advanced techniques, healthcare professionals can make more informed decisions about patient care, including whether surgical intervention, radiation, or chemotherapy is the most appropriate course of action.

Keywords: *Convolutional Neural Networks (CNNs), Residual Networks (ResNet), Tumor Classification, Malignant and Benign Detection, MRI Analysis*

ICCI2025140: BREAST CANCER DETECTION USING DEEP LEARNING TECHNIQUES

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ABSTRACT

One of the main causes of death for women globally is still breast cancer. A precise diagnosis and early detection are essential for bettering patient outcomes. Despite being the gold standard for screening, mammography is frequently flawed by subjectivity and diagnostic mistakes. Deep learning breakthroughs recently have transformed the area of medical imaging and provide potential answers to these constraints. The most recent deep learning techniques for anomaly detection, localization, and breast cancer diagnosis are thoroughly reviewed in this overview. One of the main causes of death for women globally is still breast cancer. A precise diagnosis and early detection are essential for bettering patient outcomes. Despite being the gold standard for screening, mammography is frequently flawed by subjectivity and diagnostic mistakes. Deep learning breakthroughs recently have transformed the area of medical imaging and provide potential answers to these constraints. The most recent deep learning techniques for anomaly detection, localization, and breast cancer diagnosis are thoroughly reviewed in this overview.

This paper investigates many designs, with a particular focus on their efficacy in breast cancer screening: convolutional neural networks (CNNs), U-Net, YOLO, and MobileNetV2. In a noteworthy method, U-Net and YOLO are integrated to enhance the identification and positioning of malignant lesions, leading to remarkable precision and metrics for localization. Another strategy improves the diagnosis of both benign and malignant abnormalities by utilizing MobileNetV2 for anomaly detection in order to overcome the problem of unbalanced datasets. Additionally, utilizing publicly accessible datasets like MIAS and INbreast, this review compares research by assessing the performance of various models across critical parameters including accuracy, precision, recall, and area under the curve (AUC). At the end of the study, the field's present problems—such as data imbalance and computational complexity—are discussed, and future research approaches that will help deep learning models for clinical breast cancer screening become more dependable and useful in real-time are highlighted. To further increase accuracy, lower computational overhead, and improve real-world diagnostic performance, future work will need to train these models on bigger and more diverse datasets and use optimization strategies.

ICCI2025141: A COMPARATIVE ANALYSIS OF ROUTE OPTIMISATION TECHNIQUES IN THE VEHICLE ROUTING PROBLEM

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ABSTRACT

The vehicle routing problem is a significant optimisation issue in logistics that affects the efficiency of fleet management and operational costs. Traditional methods, such as heuristic and meta-heuristic techniques, have shown effectiveness in tackling the capacity limitations and service time constraints of vehicle routing. These approaches often reflect real-world complexities more accurately than standard algorithmic methods. However, recent developments in deep reinforcement learning present new possibilities for addressing dynamic and uncertain situations, including fluctuating demands, unpredictable travel times, and real-

time decision-making. This paper evaluates traditional artificial intelligence methods, deep learning strategies, and heuristic techniques in solving various types of vehicle routing problems. Through a comprehensive analysis, this paper emphasises the advantages and disadvantages of each method, providing insights into the trade-offs involved in choosing the most appropriate approach for a given vehicle routing problem scenario.

Keywords: vehicle routing problem, logistics, artificial intelligence, deep learning, heuristic

ICCI2025142: HARNESSING DEEP LEARNING TECHNIQUES FOR THE PREDICTION OF THYROID GLAND DISORDERS

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ABSTRACT

Thyroid disease is a prevalent endocrine disorder that includes conditions like hypothyroidism and hyperthyroidism, both of which can cause serious health problems if they are not identified and treated promptly. This paper investigates the use of Deep Learning methods, more especially Convolutional Neural Networks (CNNs), to forecast thyroid disease from a large collection of medical images pertaining to thyroid conditions. This literature review explores the applications of sophisticated CNN architectures such as ResNet, Xception, and Inception, all of which are renowned for their capacity to identify complex patterns in data. The preprocessed dataset is optimized to enhance image quality and normalize inputs, thereby improving model performance. With ResNet obtaining the greatest accuracyamong the investigated architectures, the results show that deep learning models perform noticeably better than other traditional diagnostic models. The findings of this study demonstrate the potential of using modified CNN architectures to diagnose thyroid disorders early on, leading to better patient outcomes and more effective healthcare systems across the world.

Keywords: *Thyroid disease, Deep learning, Convolution Neural Network, Explainable AI, Ensemble Deep Learning.*

ICCI2025143: OPTIMIZING ELECTRIC VEHICLE ENERGY CONSUMPTION PREDICTIONS THROUGH MACHINE LEARNING TECHNIQUES

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ABSTRACT

The transport sector alone is responsible for 30% of global energy usage and pollution. In response to this, the transportation industry is adopting the electrification of vehicles to mitigate greenhouse gas emissions. Electric vehicles and their counterparts, such as hybrid electric vehicles, plug-in hybrid electric vehicles etc, offer a promising solution to support low-carbon emissions and sustainable transportation infrastructure. This survey paper aims to focus on predicting the energy consumption of electric vehicles using Machine Learning and Statistical models. Advanced Machine Learning models like Extreme Gradient Boosting and Light Gradient Boosting Machine, based on Gradient Boosted Decision Trees are compared to traditional models like Random Forest, Multiple Linear Regression and Artificial Neural Networks. To evaluate the performance of the models, statistical metrics such as coefficient of determination, root mean square error and mean absolute error were used. The models with higher values of coefficient of determination, lower mean absolute error and root mean square error values were found to be more accurate. Light Gradient Boosting Machine and Extreme Gradient Boosting outperformed the conventional models with Light Gradient Boosting Machine performing slightly better than Extreme Gradient Boosting in accuracy. These results indicate that the advanced Machine Learning models predict the performance of Electric vehicles' energy consumption more precisely.

Keywords: *electric vehicles, energy consumption, machine learning, prediction models, extreme gradient boosting, light gradient boosting machine, statistical analysis, sustainable transportation, greenhouse gas emissions, energy efficiency.*

ICCI2025144: A PURSUIT TOWARDS ENHANCED AI PERFORMANCE AND TRUST: INTEGRATION OF EXPLAINABLE AI AND HUMAN-IN-THE-LOOP APPROACHES.

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ABSTRACT

As Artificial Intelligence continues to evolve, human dependence on intelligent machines increases along with the demand for more transparent and interpretable models. There is a growing research focus and increasing public awareness regarding the active involvement of humans in the development, operation, and adoption of these systems. Explainable Artificial Intelligence points to demystify the decision-making process of Artificial Intelligence models, giving interpretable clarifications for expectations and cultivating trust among users. In spite of its progressions, Explainable Artificial Intelligence faces constraints in recognizing complex feature interactions and providing complete context, leading to misleading interpretations of feature importance and model behavior. In addition, the ability of the machine to explain the model generally builds trust and deployment of Artificial Intelligence systems in critical domains. In spite of its advancements, Explainable Artificial Intelligence faces challenges in obtaining acceptable explanations from non-human sources or explainers (Artificial Intelligence systems). Introducing humans into the loop can aid these challenges by incorporating human expertise into the life cycle of artificial Intelligence. Human-in-the-loop leverages feedback obtained from humans to clarify explanations, validate model predictions, and identify biases that automated methods may overlook Human-in-the-loop can leverage explainable Artificial Intelligence in these cases. By leveraging Explainable Artificial Intelligence, and Human in the loop, we can enhance the interpretability and reliability of Artificial Intelligence systems, highlighting the need for a balanced approach to integrating human and machine intelligence. This literature paper aims to address this gap by consolidating and analyzing complementary state-of-the-art approaches in Explainable Artificial Intelligence and Human-in-the-Loop methodologies, by exploring how these complementary approaches can be integrated to overcome the limitations of current Artificial Intelligence systems.

Keywords: Artificial Intelligence, Explainable AI, Human-in-the-Loop, Transparency, Interpretability, Trust, Bias, Model Behavior, Feedback.

ICCI2025145: THE ROLE OF ARTIFICIAL NEURAL NETWORKS IN HEALTH MONITORING AND ASSISTIVE TECHONOLOGY

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ABSTRACT

Artificial neural networks are sophisticated computational models that replicate the structure of the human brain, allowing for advanced analytical capabilities in various fields. In the healthcare sector, artificial neural networks are revolutionising health monitoring by enabling real-time personalized interventions and smart cognitive assistance systems. They are also essential in predictive modeling and health risk assessment, providing healthcare professionals with the tools needed to foresee potential health issues through detailed analyses of both historical and real-time data. This paper explores the significant influence of artificial neural networks on healthcare, emphasising their ability to transform medical practices and promote proactive health management strategies. Additionally, we introduce a prototype of wearable smart glasses designed for eye tracking and object detection, aimed at helping individuals with visual impairments or cognitive disabilities. These glasses analyse real-time visual information to offer personalized auditory cues, improving navigation and safety through the use of technology that is put forth in this work.

Keywords: artificial neural networks, health monitoring, assistive technology, artificial intelligence, predictive modelling

ICCI2025146: ADVANCEMENTS AND CHALLENGES IN DEEPFAKE TECHNOLOGY: A COMPREHENSIVE ANALYSIS OF GANS, AUTOENCODERS, AND FACE-SWAPPING TECHNIQUES

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ABSTRACT

An advancement in artificial intelligence called deepfake technology uses complex models to create simulated media that is remarkably lifelike. Fundamental to it all are Generative Adversarial Networks (GANs), in which a discriminator assesses the legitimacy of synthetic information produced by a generator. GANs generate convincing false images, audio, and video through iterative adversarial training that are almost indistinguishable from actual material. Autoencoders are essential to the creation of deepfakes in addition to GANs since they compress and rebuild picture data to produce smooth content. Face-swapping techniques allow the replacement of one person's face in multimedia with another, which further enhances the realism of deepfakes. The growing sophistication of technology presents technical difficulties for control and detection. This paper explores deepfake generation's benefits and drawbacks, raising issues with ethical misuse, security ramifications, and the difficulties in preventing the proliferation of synthetic media.

Keywords: *deepfake technology, generative adversarial networks (GANs), autoencoders, face swapping, synthetic media, neural networks, adversarial training, image reconstruction, ai ethics, media manipulation.*

ICCI2025147: TECHNOLOGICAL ADVANCEMENTS IN SATELLITE IMAGERY: TRENDS AND APPLICATIONS

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ABSTRACT

Satellite imagery plays a crucial role in fields such as environmental monitoring, disaster management, and urban planning. Recent advancements, particularly in deep learning, have significantly enhanced the speed and accuracy of satellite image analysis. But challenges including high data costs and lengthy processing times still remain. Further advancements in real-time processing and improved access to satellite data could enhance the application of this technology by underscoring the growing significance of satellite imagery in addressing global challenges. This paper examines the progress in satellite imagery technology, with a focus on enhancements in sensors, data transmission, and the integration of machine learning. Based on the improvements in satellite data analysis, this paper also proposes a prototype of a satellite-based disaster response system that leverages satellite imagery for rapid damage assessment, real-time communication with emergency teams during disasters.

ICCI2025148: A STUDY ON THE IMPACT OF BLUE EYES TECHNOLOGY ON HUMAN-MACHINE INTERACTION

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ABSTRACT

Blue Eyes Technology represents a groundbreaking advancement in the development of computational systems endowed with perceptual and sensory capabilities. By integrating cameras, microphones, and advanced image processing, this innovative technology identifies

user actions and emotions in real-time. The Blue Eyes system comprises specialized hardware and sophisticated software designed to function effectively in environments demanding continuous operator attention. This survey paper examines the foundational principles and technical components of Blue Eyes Technology, emphasizing its potential applications across diverse sectors, including healthcare, customer service, and entertainment. Additionally, we explore the technology's implications for enhancing user experience through personalized interactions, its role in improving safety and efficiency in various settings, and the ethical considerations surrounding privacy and data security. The findings illustrate the transformative impact of this technology, offering insights into its future applications and opportunities for enhanced user interaction and experience.

ICCI2025149: BEHAVIOR-DRIVEN DEVELOPMENT (BDD): BRIDGING COMMUNICATION AND ENHANCING SOFTWARE DELIVERY

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ABSTRACT

Behavior-Driven Development (BDD) is a software development methodology that focuses on describing the behavior of a system in an easily understandable language. BDD helps bridge the gap between technical team members and non-technical stakeholders by fostering clear communication and shared understanding of the system's functionality. The primary goal of BDD is to ensure that the software delivers business value by aligning the development process with the needs of both developers and business analysts. BDD evolved from Test-Driven Development (TDD), building upon its foundation by using real-world examples to define system behavior. These examples can be transformed into acceptance tests and serve as executable specifications. This approach not only ensures that the software meets its business objectives but also promotes collaboration between developers, testers, and product managers, enhancing communication and eliminating misunderstandings. By making strategic modifications to TDD, BDD has emerged as a refined development process that improves clarity and aligns software features with business goals. This paper will explore BDD in detail, including its development process, life cycle, advantages, and limitations, offering a

comprehensive view of why BDD is considered an effective approach to modern software development.

Keywords: *Behavior-Driven Development (BDD), Test-Driven Development (TDD), Software Development Methodology, Executable Specifications, Acceptance Testing, Developer-Analyst Collaboration, Example-Driven Development*

ICCI2025150: A CIRCUMSTANTIAL STUDY ON GRAPH CAST FOR WEATHER FORECASTING

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ABSTRACT

Accurate climate forecasting is critical for industries such as agriculture, aviation, and disaster management, where precise predictions are essential for effective planning and decision-making. This research aims to enhance weather prediction accuracy by applying Graph Neural Networks, sophisticated artificial intelligence models that analyze complex relationships within graph-structured data. By effectively capturing intricate spatial and temporal dependencies of weather variables, these models significantly improve forecasting precision. Additionally, this study integrates advanced data preprocessing techniques and explores innovative visualization strategies to communicate forecasting outcomes effectively. This interdisciplinary approach not only seeks to improve model robustness but also aims to bridge the gap between complex climate data analysis and practical application, empowering various sectors to make informed decisions in an increasingly variable climate landscape.

Keyword: *Climate Forecasting, Weather Prediction, Graph Neural Networks, Artificial Intelligence Models*

ICCI2025151: PERFORMING PREDICTIVE MAINTENANCE IN THE MILITARY

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ABSTRACT

The use of Artificial Intelligence in military operations serves as a significant advancement for future predictive maintenance systems and enhances operational readiness while reducing downtime. This study explores the impact of Artificial Intelligence and related technologies, such as Digital Twin Technology, in modern military operations, with a focus on predictive maintenance and Electronic Warfare. Artificial intelligence, machine learning, and natural language processing develop rapidly, enabling computers to analyze vast amounts of data in real time. This capability improves operational efficiency and allows for better decision-making. By analyzing data from sensors, satellites, and other reconnaissance sources, artificial intelligence-driven predictive modeling improves situational awareness and mission planning in the military. This capability is crucial for enhancing mission readiness, protecting troops, and optimizing resource use. Through case studies and analysis of current practices, this study examines the benefits and challenges of using Artificial Intelligence-driven technologies in military applications. The findings highlight the potential of these technologies to transform military operations, while also emphasizing the need to carefully manage associated risks to fully realize their benefits.

Keywords: Predictive Maintenance, Digital Twin Technology, Electronic Warfare, Machine Learning, Natural Language Processing (NLP), Real-time Data Processing.

ICCI2025152: AN ANALYSIS OF THE DEVELOPMENT AND APPLICATIONS OF VIRTUAL REALITY IN GAMING

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ABSTRACT

Virtual reality (VR), with its immersive and interactive experience that traditional platforms cannot match, has completely changed the game business. This study traces the growth and influence of Virtual Reality (VR) as a part of gaming, starting with Ivan Sutherland's groundbreaking HMD in 1968, directly connected to the computer, laying down the basic immersive game-like stage of development till current developments in tracking systems, motion controllers, and graphics processing, leading to sophisticated simulations for the sight, touch, and sound. Noting the line between reality and the virtual world, VR has developed the most striking 3D environments, making a participant think about what's happening in this world. This study also flashes the rise and fall of VR gaming in the 1990s followed by its rebirth during the 2000s, when it started to gain critical importance in competitive gaming. The more people tried VR formats, the more they proved to find a place in eSports and online gaming communities. With continuous innovations that offer deep interactivity and emotional engagement, virtual reality gaming does not only make a player immerse himself or herself in the gameplay but makes it new standards for storytelling and gameplay dynamics. This can be said to be at the point of modern entertainment technology revolutionizing just how we interact in digital worlds.

Keywords: Virtual Reality (VR), Immersive Technology, Gaming Experience, Head-mounted displays (HMD), Motion Controllers, Tracking Systems.

ICCI2025153: BEHAVIOR-DRIVEN DEVELOPMENT (BDD): BRIDGING COMMUNICATION AND ENHANCING SOFTWARE DELIVERY

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ABSTRACT

Behavior-Driven Development (BDD) is a software development methodology that focuses on describing the behavior of a system in an easily understandable language. BDD helps bridge the gap between technical team members and non-technical stakeholders by fostering clear communication and shared understanding of the system's functionality. The primary goal of BDD is to ensure that the software delivers business value by aligning the development process with the needs of both developers and business analysts. BDD evolved from Test-Driven Development (TDD), building upon its foundation by using real-world examples to define system behavior. These examples can be transformed into acceptance tests and serve as executable specifications. This approach not only ensures that the software meets its business objectives but also promotes collaboration between developers, testers, and product managers, enhancing communication and eliminating misunderstandings.

By making strategic modifications to TDD, BDD has emerged as a refined development process that improves clarity and aligns software features with business goals. This paper will explore BDD in detail, including its development process, life cycle, advantages, and limitations, offering a comprehensive view of why BDD is considered an effective approach to modern software development.

Keywords*: Behavior-Driven Development (BDD), Test-Driven Development (TDD), Software Development Methodology, Executable Specifications, Acceptance Testing, Developer-Analyst Collaboration, Example-Driven Development*

ICCI2025154: A STUDY ON THE IMPACT OF DIGITAL TWIN TECHNOLOGY IN THE MANUFACTURING SECTOR

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ABSTRACT

Digital Twin technology is increasingly utilized in the manufacturing sector to develop a virtual representation of physical systems, enabling enhanced monitoring, simulations, and optimizations. Digital Twins improve predictive maintenance, process optimization, and product design. A crucial aspect of this technology is its six-layer architecture, which facilitates seamless data flow between physical and digital systems, aiding manufacturers in enhancing operational efficiency. The methodology includes data collection from sensors, model construction, and the execution of continuous simulations to improve the accuracy and performance of these systems. This research also emphasizes the significance of the continuous feedback loop between digital and physical twins in reducing downtime and optimizing processes. While the technology presents considerable advantages, it also faces challenges, such as data processing and maintaining model accuracy. Ultimately, this study illustrates that Digital Twin technology has substantial potential for advancing manufacturing systems through enhanced decision-making, proactive maintenance, and decreased operational costs.

Keywords: Digital Twin, Manufacturing, Six-layer Architecture, Predictive Maintenance, Process Optimization.

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