PSG COLLEGE OF ARTS & SCIENCE

An Autonomous College- Affiliated to Bharathiar University
Accredited with A++ Grade by NAAC (4th Cycle)
College with Potential Excellence (Status Awarded by the UGC)
Star College Status Awarded by DBT –MST
An ISO 9001:2015 Certified Institution
Coimbatore – 641014

PSG

DEPARTMENT OF COMPUTER SCIENCE (SF)

Organised by

INTERNATIONAL CONFERENCE ON RECENT TRENDS IN COMPUTATIONAL TECHNOLOGIES AND SUSTAINABLE DEVELOPMENT GOALS (ICRTCTS - 2025)

25th MARCH 2025

Editors
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Dr.S.Rekha

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Dr.S.Rekha**

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Preface

The objective of the conference is to explore how emerging technologies like AI, Machine Learning, Big Data, and IoT can address global challenges and align with the UN's Sustainable Development Goals (SDGs). The conference aims to foster knowledge exchange, highlight successful applications of computational tools in areas like education, healthcare, and sustainability and promote interdisciplinary collaboration between academia, industry and policymakers. By showcasing innovative research and practical solutions, the event seeks to inspire actionable strategies that leverage technology for a more equitable, sustainable and inclusive society. We are delighted to present the proceedings of the **International Conference on Recent Trends in Computational Technologies and Sustainable Development Goals (ICRTCTSDG)**. This conference serves as a dynamic platform for academicians, researchers, industry professionals, and students from across the globe to share their insights, innovations, and advancements in the field of computational technologies and their alignment with the United Nations Sustainable Development Goals (SDGs). In an era marked by rapid technological evolution and pressing global challenges, the fusion of cutting-edge computational techniques with sustainable development initiatives is not only timely but essential. We sincerely hope that the discussions, findings, and solutions presented here will inspire further research and action toward building a better and more sustainable future. We extend our gratitude to all the participants, organizing committee members, session chairs, keynote speakers, and sponsors whose support and commitment have made this event a grand success.

Dr T Kannaian
Secretary
PSG College of Arts & Science
Coimbatore – 641014

MESSAGE

In today's fast-evolving technological landscape, higher education must constantly innovate to equip students with the expertise, adaptability, and strategic thinking necessary to thrive in a data-driven world. The **International Conference on Recent Trends in Computational Technologies and Sustainable Development Goals (ICRTCTS-2025)** provides an exceptional platform for **industry leaders, researchers, academicians, and visionaries** to explore revolutionary advancements, address emerging challenges, and unlock new opportunities in computational sciences.

By cultivating a **collaborative and forward-thinking environment**, this conference aspires to **nurture the next generation of pioneers and problem-solvers** in advanced technologies. It is a remarkable avenue for aspiring professionals to **enhance their competencies, broaden their perspectives, and accelerate their growth**.

I extend my sincere appreciation to the **Department of Computer Science (SF)** for **pioneering** this initiative. This conference is a testament to their commitment to academic excellence, research innovation, and the advancement of technology-driven solutions. I encourage all participants to seize this opportunity, engage in meaningful discussions and contribute to shaping a future **where technology enhances sustainable practices.**

Dr. M. Senguttuvan
Principal Incharge
PSG College of Arts & Science
Coimbatore – 641014.

MESSAGE

It is my privilege to extend a warm welcome to all participants of the International Conference on Recent Trends in Computational Technologies and Sustainable Development Goals (ICRTCTS-2025). This conference serves as a premier forum for industry experts, academicians, researchers, and students to engage in meaningful discussions, exchange innovative ideas, and contribute to the evolving landscape of computational technologies. As the world increasingly relies on Artificial Intelligence (AI), Machine Learning (ML), Big Data, and the Internet of Things (IoT), these technologies are pivotal in addressing global challenges and shaping a sustainable future. The integration of computational intelligence with sustainable development has the potential to drive informativeness change across various industries, enhancing efficiency, problem-solving capabilities, and technological advancements. PSG College of Arts & Science, our unwavering commitment lies in cultivating an environment of research excellence, cross-disciplinary collaboration, and technological advancement. This conference exemplifies our dedication to equipping scholars and professionals with the tools and opportunities to explore pioneering innovations and devise solutions that resonate with the United Nations' Sustainable Development Goals (SDGs). I extend my sincere appreciation to the Department of Computer Science (SF) for organizing this prestigious event and commend the keynote speakers, delegates, organizing committee, faculty, and students for their invaluable contributions. I am confident that this conference will serve as a catalyst for pioneering research, groundbreaking discoveries, and visionary collaborations. Let us work together to leverage computational intelligence for a smarter, more sustainable world.

Dr. M. Umarani
Vice principal
PSG College of Arts & Science
Coimbatore – 641014.

MESSAGE

I am happy to welcome industry professionals, academicians, research scholars, and students for the International Conference on Recent Trends in Computational Technologies and Sustainable Development Goals (ICRTCTS-2025), organized by the Department of Computer Science (SF) on March 25, 2025. This conference serves as a dynamic platform for intellectual exchange, collaboration, and discussions on cutting-edge computational advancements that contribute to sustainable global progress. The conference event delves into advancements in AI, machine learning, big data, IoT, and other revolutionary computational technologies. Focusing on innovation and sustainability, the conference highlights the crucial role these technologies play in addressing global issues and promoting the United Nations' Sustainable Development Goals (SDGs). This platform provides a unique opportunity to gain profound the insights, participate in stimulating discussions, and forge significant partnerships that propel technological progress and drive impact change.

Integration of cutting-edge technologies into interdisciplinary research. Our goal is to equip scholars with the expertise, knowledge, and resources necessary to excel in a digital world. This conference exemplifies our dedication to advancing pioneering research, inspiring innovative ideas, and creating technological solutions that contribute to a sustainable future.

I encourage all the participants to actively engage, exchange knowledge, and contribute to shape the future of computational sciences. Wishing you all a successful, insightful, and enriching conference experience.

CONTENTS

SUSTAINABLE AND SECURE E-DATA MANAGEMENT: INSIGHTS FROM THE UNIVERSITY OF TECHNOLOGY & APPLIED SCIENCES [UTAS]

Dr. Balaji Dhanasekaran

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Abstract

The rapid proliferation of digital transformation across various industries has resulted in an unprecedented accumulation of electronic data waste posing significant environmental economical and security challenges. This research paper is a study of e-data waste management policies in Education sector and includes the lifecycle of e-data, from the initial process of creation till the secure disposal. This research paper also analyses the best practices in data minimisation, retention and secure deletion techniques used by various departments in University of Technology & Applied Sciences [UTAS]. The findings are used to propose a framework for establishing e-data waste management policies in

UTAS including the principles of sustainable, secure and operational efficiency. This paper also provides insights and guidance for policymakers to mitigate the risk associated with e-data waste.

Keywords-Edata Waste, Sustainable Development, UTAS, Digital Sustainability, Data Security

THE DIGITAL TRANSFORMATION OF UNIVERSITIES: DEEPSEEK & ROLE AT UTAS

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Abstract

Artificial Intelligence (AI) is altering the educational model, particularly in university settings. This paper explores the integration of AI, specifically the Deep Seek platform, into the University of Technology and Applied Sciences (UTAS) to improve teaching, learning, research, and administrative processes in higher educational institutions. The study highlights how AI can computerize repetitive work and give personalized learning experiences and streamline research processes. AI identifies challenges like data privacy concerns and the requirement for continuous

training, and dependency on AI tools. AI significantly improves productivity and inclusivity, addressing these challenges is crucial for sustainable integration. Future research may focus on optimizing AI integration, focusing ethical considerations, and discovering its long-term impact on educational outcomes.

Keywords- Artificial Intelligence [AI], University of Technology and Applied Sciences [UTAS], DeepSeek platform, Higher Educational Institutions [HEI].

MEDICAL INSURANCE PREMIUM PREDICTION USING DEEP LEARNING ALGORITHMS

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Abstract

This research proposes an application of deep learning techniques toward the prediction of insurance premiums using ConvLSTM, BI-LSTM, and CNN-LSTM models. Nowadays, Insurance is becoming more sophisticated, there is a need for better models that predict premiums so that risk factors can be properly valued. The purpose of this study is to analyze historical data covering age, gender, medical history, claim history, and lifestyle factors to formulate a strong prediction model. The purpose of this research was to study the performance of these deep learning architectures and compare the accuracy, efficiency, and generalization of the models on dataset. Moreover, Deep learning models are typically regarded as black-box models, this study also utilized Explainable AI (XAI techniques), LIME (Local Interpretable Model-

Agnostic Explanations) to understand and interpret model predictions alongside feature importance. The results show that deep learning models provides a far better approach than traditional methods as it enables better predictive capabilities and powerful insights for changes and improvements to insurance predicting models.

Keywords-Deep Learning, Health Insurance, XAI, LSTM, Machine Learning

ZERO-DAY ATTACK DETECTION IN CLOUD INFRASTRUCTURE WITH TRANSFORMER-BASED MODELS

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Abstract

Zero-day attacks pose a significant threat to cloud infrastructure, exploiting unknown vulnerabilities and bypassing traditional security mechanisms. This paper proposes a novel approach to zero-day attack detection using transformer-based models, leveraging their capability to learn complex patterns and detect anomalies in high-dimensional data. The implementation of a transformer architecture trained on network flow data achieves high accuracy in identifying suspicious activities. Experimental results demonstrate the model's effectiveness in detecting previously unseen attacks with minimal false positives.

Keywords-Zero-day attacks, cloud security, anomaly detection, transformers, deep learning, network intrusion detection

HYBRID MACHINE LEARNING MODEL FOR RAINFALL PREDICTION WITH IMBALANCED DATA

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Abstract

Rainfall prediction is a challenging process, especially when using traditional techniques. Precise forecasts are crucial for different stakeholders, such as people organizing outdoor activities, farmers who want to save their crops, and fishermen whose livelihoods are based on weather. Machine learning (ML) models have demonstrated immense potential in improving rainfall prediction accuracy in recent years. Our suggested framework utilizes classification algorithms like XG Boost, K-Nearest Neighbours (KNN), Multi-Layer Perceptron (MLP), and a Hybrid Model integrating LSTM and Random Forest to build a strong ML-based rainfall prediction system. SMOTE (Synthetic Minority Over-sampling Technique) is applied to counter data imbalance in order to provide better representation of the minority class for enhanced classification performance. Moreover, Robust Scaler is used to deal with outliers, and Grid Search CV is used for hyperparameter tuning in order to tune the model to perform better. Out of the classifiers tested, the Hybrid Model

(LSTM + Random Forest) was found to be the top-performing model with an F1-score of 0.89, precision of 0.88, recall of 0.91, and accuracy of 0.85. XG Boost is a close second with an F1-score of 0.90, precision of 0.89, recall of 0.92, and accuracy of 0.84, showing excellent predictive performance through its gradient boosting algorithm. MLP also did quite well with an F1-score of 0.86,precision of 0.92, and recall of 0.82, showing how effective it is at identifying intricate data patterns. KNN, with 0.83 F1-score, 0.91 precision, and 0.76 recall, is still a competitive option for classification problems even with its parameter sensitivity. These results prove the success of machine learning methods in enhancing rainfall prediction, providing substantial improvement over conventional forecasting techniques.

Keywords - Machine learning, rainfall prediction, Random Forest, Ensemble Learning, SMOTE

A DESCRIPTIVE REVIEW-BASED APPROACH FOR COLLEGE SELECTION USING NLP, JSON DATA EXCHANGE, AND MACHINE LEARNING CLASSIFICATION

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Abstract

Choosing the right college is a crucial decision for students. This paper proposes a novel approach that leverages Natural Language Processing (NLP), JSON data exchange, and Machine Learning (ML) classification to analyze student-generated and college-provided descriptive reviews (e.g., student forums, college websites, alumni testimonials) and recommend colleges based on individual student preferences and needs. We outline a framework that extracts meaningful features from textual data using NLP techniques, structures and exchanges data via JSON, and employs ML classifiers to automate the recommendation process. This student-centric approach aims to enhance the objectivity and personalization of college selection, providing a more comprehensive understanding of college fit.

Keywords-Natural Language Processing (NLP), Machine Learning (ML), JSON, Classification.

ABUSE DETECTION IN HEALTHCARE USING MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE

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Abstract

Abuse in healthcare settings, including patient mistreatment, fraud, and neglect, is a critical concern that affects patient safety, trust, and resource allocation. Traditional detection methods are often inefficient and lack the capability to process large-scale healthcare data. With advancements in artificial intelligence (AI) and machine learning (ML), automated abuse detection systems have become a promising solution. This paper explores the role of ML and AI in detecting various forms of abuse in healthcare, discussing key methodologies, challenges, and future directions..

Keywords-Healthcare Abuse, Machine Learning, Artificial Intelligence, Fraud Detection, Anomaly Detection

DIABETES PREDICTION USING RECURRENT NEURAL NETWORKS

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Abstract

Millions of individuals worldwide suffer from the chronic illness known as diabetes. For efficient management and therapy, early diagnosis and prediction are essential. Using patient health data, we provide a model for diabetes prediction in this research that is built on recurrent neural networks (RNNs). Time-series health records are one kind of sequential data that the model uses to capture temporal dependencies and increase prediction accuracy. The model is tested on a publicly accessible dataset, and its performance is contrasted with that of conventional machine learning algorithms such as Support Vector Machines (SVMs), Random Forest, and Logistic Regression. As evidenced by the data, the RNN-based method performs better than traditional techniques, indicating its potential for early diabetes prediction. Our conclusions are further supported by a thorough literature study, a comparative analysis of the data, and visualizations.

Keywords-RNN, SVM, RF, LR, Diabetes

THE IMPACT OF CONVOLUTIONAL NEURAL NETWORK IN PLANT LEAF DISEASE DETECTION

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Abstract

Leaf Disease can be detected with the help of computer vision. In recent times, one of the Deep Learning (DL) techniques called Convolutional Neural Networks (CNN) outperforms traditional Image processing algorithms. And it is found that Image Processing algorithms require a lot of time for the process of feature extraction. The key feature of CNN is that they do not need the feature extraction data beforehand. With the help of Artificial Neural Networks, CNNs can learn about features on their own based on the given set of input data. This survey paper deals with the evolution of CNNs concerning Leaf Disease Detection. The success of CNNs highly relies on the quality of the data set used for input. Existing works related to different kinds of CNNs are considered and their impacts based on the performance metrics like Precision, Recall, and F1 score are focussed. CNNs are efficient and show great performance in terms of precision and classification accuracy.

Keywords-Image Processing, Deep Learning, Convolutional Neural Networks, Leaf Disease Detection, Precision, Accuracy.

A LITERATURE REVIEW ON ADAPTIVE LEARNING AND ASSESSMENT WITH EXPLAINABLE AI A LITERATURE REVIEW ON ADAPTIVE LEARNING AND ASSESSMENT WITH EXPLAINABLE AI

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Abstract

Artificial Intelligence, or AI, is the simulation of human intelligence in machines by enabling tasks like learn- ing, reasoning, problem-solving, and decision-making. Artificial Intelligence in the field of Education has shown immense po-tential from creating personalized learning paths to automating administrative and assessment tasks. This revolution promises a significant leap in how education is delivered and experi- enced. Adaptive learning enabled by AI algorithms, enables the students to learn their concepts based on their unique needs, preferences, and pace. However the adaptive learning platforms lacks transparency and without transparency it also lacks trust. This paper explores the potential of Artificial Intelligence in the field of education, focusing on creating transparent, ethical, and effective learning environments through Explainable AI (or XAI).

Keywords-Artificial intelligence, Adaptive learning, AIED, Explain ability AI, Personalized learning, E-learning

AN ADVANCED WEB-ENABLED FRAMEWORK FOR STORAGE AND ORCHESTRATED MANAGEMENT OF PERSONAL HEALTHCARE DATA

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Abstract

A Personal Health Record (PHR) Maintenance System is a digital platform that enables individuals to manage and store their health-related information. It includes records such as medical history, diagnoses, medications, test results, and immunizations. The system allows users to access their health data anytime, track their health over time, and share information securely with healthcare providers and close-circle friends for community-based health monitoring. Security and privacy are key priorities, ensuring that the data is protected and accessible only to authorized users. This paper discusses the challenges in healthcare data management, the architecture of the proposed framework, and its role in improving healthcare accessibility and efficiency.

Keywords: Personal Health Record, Digital Healthcare, Data Security, Health Monitoring, Cloud Storage.

SOCIAL MEDIA ANALYTICS DASHBOARD FOR MARKETING (SMAD)

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Abstract

Social media has become a crucial channel for digital marketing, enabling businesses to engage with audiences, track campaign performance, and optimize strategies in real time. This paper presents the development of a Social Media Analytics Dashboard (SMAD) that integrates data from multiple platforms, providing actionable insights for marketers. The dashboard leverages Natural Language Processing (NLP), sentiment analysis, and data visualization techniques to analyze customer engagement, brand sentiment, and content effectiveness. Machine learning algorithms assist in trend prediction and audience segmentation, ensuring data-driven decision-making. A case study evaluating SMAD's effectiveness in a real-world marketing campaign demonstrates its potential to enhance return on investment (ROI) and customer engagement. Future improvements include real-time AI-driven recommendations and deeper sentiment trend analysis**.**

Keywords-Social Media Analytics, Digital Marketing, Data Visualization, Sentiment Analysis, Social Media Dashboard.

INTEGRATED WASTE COLLECTION AND DISPOSAL PLATFORM (IWCDP)

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Dr B Gayathri

Associate Professor, Department of Computer Science,
Bishop Heber College (Autonomous), Tiruchirappalli.

 Abstract

This paper presents the Integrated Waste Collection and Disposal Platform (IWCDP), a technology-driven solution aimed at optimizing waste management processes. The platform integrates IoT, cloud computing, and data analytics to enhance waste collection efficiency, reduce environmental impact, and promote sustainable waste disposal practices. This study outlines the development, implementation, and evaluation of the IWCDP, emphasizing its role in modernizing waste management systems for urban and rural communities. Results demonstrate the platform's effectiveness in real-time waste tracking, automated scheduling, and predictive analytics for waste generation trends.

Keywords-Integrated Waste Collection and Disposal Platform (IWCDP),Smart Waste Management, IoT (Internet of Things),Cloud Computing, Data Analytics, Sustainable Waste Disposal, Waste Management Optimization, Urban and Rural Waste Management ,Real-time Waste Tracking, Predictive Analytics for Waste Generation Trends.

AI-BASED KIDNEY STONE DIAGNOSIS A TRANSFER LEARNING APPROACH

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Abstract

Kidney stone formation, also known as nephrolithiasis, is a common urological disorder affecting millions worldwide. Early diagnosis is essential to prevent severe complications such as urinary tract infections and renal failure. It's crucial to identify kidney stones early on in order to intervene or obtain the appropriate medical care. Renal dilatation and renal function are both decreased by the presence or recurrence of kidney stones. Through many image processing procedures, the method for detecting kidney stones is shown in this study. The first phase is the pre-processing of the image using filters, which involves both smoothing and noise removal from the image. The preprocessed picture is then used as a starting point for guided active contour technique image segmentation then analyzing renal image data using the VGG16 model technique to detect illnesses. CT is utilized as the imaging modality because it produces less noise than other modalities like x-ray and ultrasound. This study

introduces a transfer learning-based approach for automated kidney stone detection using the VGG16 model. The proposed methodology involves image preprocessing, segmentation using the guided active contour technique, and classification through deep learning. The system achieves high accuracy and significantly reduces false positives, making it a promising tool for clinical applications.

Keywords-Kidney Stone Detection, Transfer Learning, Deep Learning, VGG16, Image Segmentation, Medical Imaging.

PREDICTION OF DIABTIC RETINOPATHY USING IMPROVED VGG19

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Abstract

Diabetic Retinopathy (DR) is a progressive eye disease that affects individuals with diabetes, potentially leading to vision impairment or blindness if left undiagnosed. Early detection and timely intervention are crucial in preventing severe complications. In this study, we propose an improved Visual Geometry Group 19-layer network (VGG19) model for the accurate prediction of DR, leveraging deep learning techniques to enhance feature extraction and classification. The traditional VGG19 architecture is modified by incorporating additional convolutional layers, optimized hyperparameters, and advanced activation functions to improve model performance. A publicly available DR dataset is used for training and validation, ensuring the model's reliability and robustness. Preprocessing techniques, including contrast enhancement and noise reduction, are applied to improve image quality before feeding them into the network. The model is trained using transfer learning and fine-tuning strategies to achieve higher accuracy and reduced computational

complexity. Performance evaluation is conducted using metrics such as accuracy, sensitivity, specificity, and F1-score to validate the effectiveness of the improved model. Experimental results demonstrate that the proposed approach outperforms conventional deep learning models in DR classification. The improved VGG19 model provides a reliable and automated solution for early DR detection, aiding ophthalmologists in clinical decision-making. This research contributes to the advancement of medical image analysis by integrating deep learning techniques for disease prediction. Future work involves optimizing the model further and testing it on diverse datasets for broader applicability

Keywords-Deep Learning (DL), Diabetes, Diabetic Retinopathy (DR), Improved VGG19, Visual Geometry Group 19-layer network (VGG19),

A MACHINE LEARNING APPROACH TO PERSONALIZED BOOK RECOMMENDATIONS

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S.Gayathri

Student, Department of Computer Science and Applications, Vivekanandha College of Arts and Sciences for Women (Autonomous), Elayampalayam, Namakkal.

Abstract

In the digital age, the overwhelming availability of books across various genres and formats makes it challenging for readers to discover literature that aligns with their preferences. This study presents a machine learning-powered book recommendation system designed to enhance user experience by providing personalized suggestions. The system integrates collaborative filtering and content-based filtering techniques to analyze user preferences and book characteristics, ensuring relevant recommendations. The dataset comprises user ratings, book descriptions, and metadata, which are processed to extract meaningful features. Machine learning algorithms, including k-Nearest Neighbours (k-NN) and matrix factorization techniques, are employed to train the model and identify patterns in user behaviour. The system's performance is evaluated using metrics such as Mean Absolute Error (MAE) and Root Mean Squared Error (RMSE) to ensure recommendation accuracy. Results indicate the effectiveness of the proposed approach in delivering tailored

book suggestions, enhancing the reading experience. Furthermore, this work highlights future improvements, including the integration of natural language processing (NLP) for enhanced content evaluation and user engagement, showcasing the potential of AI-driven recommendation systems in the literary domain.

HARNESSING ARTIFICIAL INTELLIGENCE FOR FINANCIAL INCLUSION: OPPORTUNITIES, CHALLENGES, AND POLICY IMPLICATIONS

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Abstract

Financial exclusion remains a significant challenge in developing economies, where millions lack access to formal financial services. Artificial Intelligence (AI) has emerged as a potential game-changer in promoting financial inclusion. This research explores the application of AI-driven solutions in enhancing financial inclusion, particularly among underserved populations. The study employs a mixed-methods approach, combining qualitative and quantitative data from various sources, including financial institutions, regulatory bodies, and end-users. The findings suggest that AI-driven solutions, such as machine learning-based credit scoring, natural language processing-powered chatbots, and biometric authentication, can significantly improve access to financial services. The results also highlight the potential of AI-driven solutions in reducing costs, increasing efficiency, and enhancing customer experience.

However, the study also identifies several challenges, including data quality issues, regulatory frameworks, and digital literacy concerns. This research contributes to the existing literature on financial inclusion and AI, providing insights into the opportunities and challenges associated with AI-driven financial inclusion initiatives. The study's findings have implications for policymakers, financial institutions, and technology providers seeking to leverage AI in promoting financial inclusion.

Keywords-Artificial Intelligence (AI), Financial Inclusion, Machine Learning (ML), Natural Language Processing (NLP), Biometric Authentication, Digital Financial Services

AI-DRIVEN SECURITY ENHANCEMENTS FOR ACCOUNT ACCESS MANAGEMENT: A COMPREHENSIVE APPROACH

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Abstract

In today's digital world, protecting user accounts from unauthorized access is a major concern. Traditional methods like passwords and two-factor authentication provide some security but are not always enough to prevent modern cyber threats. To address these issues, this paper presents an AI-driven framework that improves account security using machine learning techniques. The proposed system combines behavioural analytics, adaptive authentication, and anomaly detection to offer a comprehensive solution. The Behavioural Analytics Module analyzes user behaviour patterns, such as login time, location, and device information, to detect suspicious activities. The Adaptive Authentication Module assigns risk scores and introduces additional security checks when risky behaviour is detected. The Anomaly Detection Module uses machine learning algorithms to spot unusual patterns that may indicate hacking attempts. Our framework was tested with real-world data collected from over 500,000 login records. The results showed a 30% improvement in threat

detection accuracy compared to traditional security methods. False positives were reduced significantly, ensuring that legitimate users experienced minimal disruption. The system efficiently adjusted authentication measures based on risk assessment, improving both security and user experience. Future improvements may include adding blockchain for enhanced data integrity and integrating federated learning to boost data privacy. This AI-based approach offers a promising solution to secure user accounts in today's rapidly evolving digital landscape.

Keywords-Account Access Management, Artificial Intelligence, Behavioural Analytics, Anomaly Detection, Adaptive Authentication, Cybersecurity.

SOCIAL MEDIA INFLUENCE MAXIMIZATION USING LOGISTIC REGRESSION MACHINE LEARNING ALGORITHM

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Abstract

Users' interactions with content and with one other in social networks are greatly influenced by social homophily and influence in social recommendation systems. This plays a crucial part in deciding how consumers engage with the information. The idea of homophily—the propensity of people with similar traits or interests to interact and create partnerships—is heavily emphasized in the study of social networks. Three different datasets from YouTube, Instagram, and Facebook are used in our analysis. After the dataset was gathered from the Kaggle source, preprocessing was done on it. Following initial dataset processing, we use fusion machine learning to classify the data. The suggested approach regularly outperforms the existing methods in terms of accuracy, with rates for Facebook, Instagram, and YouTube of 95.51%, 96.38%, and 96.49%, respectively.

Keywords- Classification, Disentangled Modeling, Machine Learning, Social media

INBC – SMART FARMING: CROP RECOMMENDATION SYSTEM USING IMPROVED NAIVE BAYES CLASSIFICATION ALGORITHM

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Abstract

Crop prediction is a fast growing discipline that is essential to the advancement of agricultural practices. Crop suggestions are crucial in agriculture because they assist farmers select the most excellent crops for their region and environment. In this article, the Improved Naive Bayes Classification (INBC) machine-learning technique is worn to analyze crop recommendation performance. The recommended system makes use of a various feature, such as soil data and climatic information, to precisely predict which crop will grow best in a given location. Crop suggestion could be revolutionized by this technology, which would benefit farmers of every sizes by increasing crop yield, sustainability, and over all productivity. Through, thorough analysis of a chronological data set, we have trained and tested models using the Naive Bayes technique, reaching perfect accuracy. We demonstrated the model's potential outcomes. By using performance metrics such as MAE, R^2, Recall, Precision and F1-Score, we exposed that this INBC model works well. We exposed that the

INBC representations predicted outcome coincides with expected data, demonstrating the model's effectiveness. For farmers, agricultural stakeholders, and politicians, this suggested approach has important implications since it facilitates data-driven decision-making and resource allocation that improve crop yields.

Keywords-Machine Learning, Feature Selection, Classification, Naive Bayes, Crop prediction.

AN EFFICIENCY SECURED AUTHENTICATION PROTOCOL FOR AERIAL DRONE

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Abstract

Security and safety concerns have arisen as a result of the wide-ranging custom of drones. Unauthorized drone flying poses security vulnerabilities that are mitigated by an Internet of Drones (IoD) set-up context. It is explicitly intended to diminish the volume of traffic processing expenses instigated by asymmetric cryptography computations and certificate exchanges, which are characteristically essential for substantiation protocols. In the intricate ecosystem of the Internet of Drones, we are excited to introduce a groundbreaking solution known as SAPAD (Secured Authentication Protocol for Aerial Drone) has been developed to operate with greater efficiency than traditional Transport Layer Security (TLS) protocols typically used for Internet of Things (IoT) devices. The protocol enhances drone security by creating a unique aeronautical session key for each flight plan, which is stored in a centralized database accessible to ground control personnel. This method uses message authentication code to substantiate the drone. For an efficient security and authentication ProVerif, a formal verification tool, to construct and assess the protocol is used. Additionally, we integrated several cryptographic

techniques, including ECDSA (Elliptic Curve Digital Signature Algorithm), PBKDF2 (Password - Based Key Derivation Function 2) and HMAC-SHA256 to enhance the safety framework of SAPAD. This approach ensures a robust solution for securing drone operations, addressing the critical security challenges associated with their use.

Keywords -Drone: Session Key: Protocols: Communication: Database: Framework

INDOOR LOCALIZATION USING CONVOLUTIONAL NEURAL NETWORK WITH FINGERPRINT OF ACCESS POINT

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Abstract

This paper addresses indoor localization utilizing the Finger Print method, which relies on the Received Signal Strength Indicator (RSSI) from wireless LAN access points (APs). In recent years, there has been considerable discourse surrounding localization techniques that employ Deep Learning. We have introduced a Finger Print approach based on Convolutional Neural Networks (CNNs). This involves establishing the adjacency relationships among APs within a two-dimensional framework, which is then utilized to develop the CNN model for Finger Print localization. To validate the enhancement in localization accuracy afforded by this approach, we conducted experiments and analyzed the resulting data.

Keywords- Localization, wireless LAN, CNN, Finger Print.

EFFICIENT FEDERATED DEEP REINFORCEMENT LEARNING ARCHITECTURE FOR NFV RESOURCE ALLOCATIONS

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Abstract

A new networking technology in the telecom sector called network function virtualization lowers operating and capital costs while enabling network service deployment. By combining different kinds of network equipment onto industry-standard, high volume servers, switches, and storage systems which could be located in data centers, network nodes, or at the end user's location NFV aims to address issues by using standardized IT virtualization technologies. In addition to a number of research challenges, including VNF management and orchestration, service chaining, VNF scheduling for low latency, and effective virtual network resource allocation with Network Function Virtualizations Infrastructure (NFVI), the software-oriented approach known as Virtual Network Functions (VNFs) produces a highly flexible and dynamic network to meet multiple demands. However, because of inefficiency, complexity of SFC, increasing latency, imbalance of load and poor scalability is still a major difficulty in NFV systems. This paper suggests

an efficient NFV resource allocation system that makes use of Long Short-Term Memory (LSTM) networks and Federated Deep Reinforcement Learning (FDRL) in order to overcome these difficulties. The suggested method is divided into several stages: (1) LSTM-based traffic prediction, which forecasts future demands by analyzing historical NFV resource usage patterns. (2) Federated Learning (FL) for distributed model training, guaranteeing privacy-preserving optimization without direct data sharing. (3) Deep Reinforcement Learning (DRL)-assisted VNF placement and resource scaling, allowing dynamic and adaptive NFV management. By combining these strategies, network efficiency is increased, latency is decreased, and resource utilization is improved.

Keywords-NFV,VNF, Predictive Modeling, FL&DRL,LSTM,DRL.

AI-DRIVEN SMART WASTE MANAGEMENT: OPTIMIZING RECYCLING AND WASTE REDUCTION THROUGH IOT AND MACHINE LEARNING

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Abstract

Waste management is a critical challenge for environmental sustainability, with inefficient recycling and waste disposal contributing to pollution and resource depletion. This research explores an AI-driven smart waste management system that leverages IoT sensors, machine learning, and blockchain to optimize waste collection, recycling, and reduction. The primary objectives include real-time waste monitoring, automated waste classification, and efficient recycling process optimization. IoT sensors embedded in waste bins will track fill levels and send data to an AI-based system, which will predict collection schedules and reduce operational costs. Machine learning algorithms will enhance waste sorting efficiency, distinguishing between recyclables and non-recyclables. Additionally, blockchain technology will ensure transparency in waste tracking and recycling compliance. The proposed system aims to minimize landfill waste, lower carbon footprints, and promote a circular economy by improving waste management efficiency and encouraging sustainable practices.

Keywords-Smart Waste Management, Artificial Intelligence (AI), Internet of Things (IoT), Machine Learning, Blockchain for Waste Tracking, Recycling Optimization, Sustainable Waste Reduction.

EFFECTS OF EXCESSIVE MOBILE USE ON CHILD DEVELOPMENT: TECHNOLOGICAL SOLUTIONS FOR MITIGATION

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Abstract

The growing reliance on mobile devices among children has sparked concerns about its effects on their cognitive, social, and physical well-being. Excessive screen time is associated with diminished attention spans, weakened social interactions, and sedentary behaviours, potentially leading to long-term developmental issues. Cognitively, overuse of mobile devices may impair critical thinking and problem-solving skills, while socially, it can reduce opportunities for face-to-face communication, impacting emotional intelligence. Physically, prolonged use often results in poor posture, eye strain, and insufficient physical activity, increasing risks of obesity and related health problems. To counteract these challenges, technological solutions such as screen time management apps, content filters, and gamified fitness programs are being developed. These interventions aim to promote balanced device usage, encourage healthier habits, and support overall development. This abstract explores the negative consequences of excessive mobile device use on children and investigates how technology can be harnessed to mitigate these effects, fostering a more balanced and healthy developmental environment.

Keywords-Mobile Device Usage, Child Development, Cognitive Impact, Social Skills, Physical Health, Technological Interventions.

DESIGN AND DEVELOPMENT OF ENHANCED DEEP LEARNING METHODOLOGY FOR TAMIL MANUSCRIPTS EXTRACTION USING HYBRID CNN-LSTM-CTC

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Abstract

Data extraction from manuscripts using Deep Learning emerged as a crucial task in various fields, including historical document analysis, digitization of records and information retrieval. With the advent of deep learning, new possibilities for efficient and accurate data extraction have surfaced. This paper explores a systematic approach by combining segmentation, Convolutional Neural Network (CNN) and classification techniques. This helps to extract meaningful information from handwritten and printed manuscripts. Tamil manuscripts, rich in cultural and historical significance faces unique challenges for data extraction due to their complex scripts, varied writing styles and degradation over time. So it is necessary to review the challenges, datasets, pre-processing methods, and state-of-the-art in deep learning approaches. A hybrid CNN-Long Short-term Memory (LSTM)- Connectionist Temporal Classification(CTC) is proposed. In this approach, preprocessing can be done using Optical Character Recognition (OCR).A well-suited LSTN-CNN is used for capturing sequential dependencies in text. Finally CTC function helps in handwritten text recognition and text extraction of Tamil manuscripts.

Keywords-Deep Learning, Tamil manuscripts, Convolutional Neural Network (CNN), Long Short-Term Memory (LSTM), Connectionist Temporal Classification.

IOT-ENABLED SMART CITY INFRASTRUCTURE: A FRAMEWORK FOR SUSTAINABLE URBAN DEVELOPMENT

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Abstract

The rapid expansion of urban populations has increased the demand for smarter, more efficient, and sustainable city infrastructures. The Internet of Things (IoT) has emerged as a key enabler for smart city development, providing real-time data collection, analytics, and automation to optimize urban services. This paper presents a comprehensive framework for IoT-enabled smart city infrastructure, focusing on critical areas such as smart grids, water management, waste management, intelligent transportation, environmental monitoring, and public safety. The integration of IoT in urban systems enhances operational efficiency, reduces environmental impact, and improves the quality of life for citizens This paper explores emerging solutions, including AI-driven IoT, block chain integration, and 5G connectivity, to address these challenges and shape the future of sustainable urban development.

Keywords-Internet of Things (IoT), Smart City, Infrastructure Management, Framework, sustainable urban development.

SAFETY MOBILITY DESIGN FOR PEDESTRIANS AND PERSONS WITH DISABILITIES IN VANET

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Abstract

The Best classroom in the world is at the feet of persons. In Transportation, Intelligent Transportation System (ITS) improves the quality of senior citizen people lives. ITS plays a vital role in the applications of road transportation. ITS uses advanced technologies that enclose computing, sensors, communication and controls. On commercial as well as safety grounds their requirements and importance should not be neglected in ITS developments. One of the arms of ITS is that it enhance vehicle safety as well as it ensures secure for pedestrian. This paper presents here about what are all the health issues of pedestrian and what are all the recent way of dealing the problem faced by the pedestrian and some recommendation are also disclose. In addition to that this paper mainly focuses on the safety and security concern of pedestrian. At the end of the paper it has been discern how technologies impact with the safety of road users and also with few directions for further research.

Keywords-Intelligent Transportation System (ITS), Vehicle Safety, Pedestrian Safety, Road modification

DEEP LEARNING AND MACHINE LEARNING APPROACHES FOR GAIT ANALYSIS AND NEUROLOGICAL DISORDER DETECTION USING ACCELEROMETRIC DATA

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Abstract

Ataxic gait monitoring and neurological status evaluation are important multidisciplinary issues that use digital signal processing technology and machine learning methods. This study investigates the use of accelerometric data to improve deep learning convolutional neural network systems for identifying ataxic and normal gait. The experimental dataset includes 860 signal segments from 16 ataxic patients and 19 control participants, with average ages of 38.6 and 39.6 years, respectively. The proposed method is based on analysing the frequency components of accelerometric data obtained at specific body postures at a sampling rate. The deep learning technique uses all of the frequency components in a range. Our classification results are compared to those obtained using established approaches such as the support vector machine, neural network methods, and the two-layer neural network, with characteristics measured as relative power in certain frequency bands.

Keywords-Gait analysis, accelerometric data, detecting neurological disorders, machine learning algorithms, and deep learning models.

CORAL REEF HEALTH DETECTION USING YOLO ALGORITHM

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Abstract

Key marine ecosystems, coral reefs sustain biodiversity, safeguard coastlines, and boost the world economy. However, these ecosystems are under severe threat due to pollution, human activity, and climate change. Effective conservation efforts depend on the timely diagnosis of coral reef health and related illnesses. Using the YOLO (You Only Look Once) algorithm, a forefront deep learning object identification framework, we present a real-time, automated system for detecting coral reef health and diseases. YOLO is a great option for identifying coral diseases like coral bleaching, tissue loss, and colouration from underwater photos and videos because of its rapid and precise image processing capabilities .A carefully selected dataset of annotated coral reef photos is used to train the suggested system, which records both healthy coral structures and a variety of illness symptoms. The YOLO algorithm is optimized for underwater environments, accounting for challenges like low contrast, varying light conditions, and occlusions. Through extensive testing, the system demonstrates high precision and recall rates in distinguishing between healthy corals and those affected by different diseases. This approach allows for continuous monitoring of coral reefs in real-time,

aiding marine biologists and conservationists in taking prompt action to protect and restore these delicate ecosystems. The study's findings show how artificial intelligence—more especially, YOLO—can improve protection and observation of coral reefs. Future research will concentrate on growing the dataset, improving detection accuracy, and integrating the system with autonomous underwater vehicles (AUVs) for large-scale coral reef health assessments.

Keyword-Coral reef, Health, Diseases, Detection, YOLO algorithm, Object detection, Deep learning, Conservation, Monitoring, Marine ecosystems

CONVOLUTIONAL NEURAL NETWORKS FOR ACCURATE PNEUMONIA DETECTION IN MEDICAL IMAGING

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Abstract

Pneumonia remains to be a significant global health threat, particularly in developing countries, highlighting the grave essential for rapid and accurate diagnostic methods. This research offering a optimal technique exploits a Deep Convolutional Neural Network (CNN) to classify pneumonia from the X-ray image sources which has taken from chest. Recognizing the limitations of traditional diagnostic methods, which often rely on histopathological images and can be prone to errors, our system aims to enhance early detection. We employed a dataset sourced from the Lung Image Database available on the Kaggle Machine Learning Repository, comprising both pneumonia-affected and healthy lung images. The proposed methodology involves user-uploaded chest X-ray images, which undergo preprocessing steps including image segmentation and conversion to grayscale. Subsequently,each segmented region is analyzed by the CNN to determine the presence of pneumonia. Our results indicate that thismethod not only enhances diagnostic accuracy but also substantially decreases the time required for evaluation, thereby contributing to more effective pneumonia management and treatment strategies. This research holds promisefor advancing the application of

deep learning in medical imaging, with potential implications for improving patient outcomes in the face of pneumonia outbreaks.

Keyword- Pneumonia Detection, Medical Image Classification, Convolutional Neural Networks, Chest X- Ray Imaging, Deep Learning.

BLOCKCHAIN-BASED SUPPLY CHAIN TRACEABILITY

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Abstract

Enhancing transparency, security, and efficiency in contemporary supply chains is the goal of the revolutionary approach known as blockchain-based supply chain traceability. Blockchain ensures that every transaction and movement of products is recorded immutably and is available in real time to all authorized stakeholders by employing decentralized ledger technology. By giving businesses, a complete picture of a product's history and empowering them to confirm the legitimacy and compliance of its components at every turn, this system reduces fraud, counterfeiting, and inefficiencies. Moreover, by automatically logging and capturing crucial data, blockchain's interaction with IoT devices improves data accuracy. In the process of ensuring regulatory compliance, fostering consumer trust, and streamlining logistics, this revolutionizes conventional supply chain management.

Keywords- Blockchain, Supply Chain Traceability, Decentralized Ledger, Transparency, Fraud Prevention, Product Provenance, IoT Integration, Consumer Trust, Logistics, Compliance.

SMART AGRICULTURE: LEVERAGING ROBOTICS AND AUTOMATION FOR EFFICIENT HARVESTING USING IOT

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Abstract

The rapid development of technology has revolutionized various industries, and agriculture is no exception. This paper explores the transition from **traditional agriculture to smart agriculture,** focusing on how robotics, sensors, and simulation technologies are reshaping modern farming. Traditional farming practices often face challenges such as high labor costs, inefficient resource usage, and slow scalability. In contrast, smart agriculture leverages technologies such as robotics, Internet of Things (IoT) sensors, and data analytics to increase efficiency, reduce environmental impact, and enhance crop production. The core of this study involves the development of harvesting robots, their gripper mechanisms, and the sensors used for optimizing farming processes. It also discusses the use of the **Robotic Operating System (ROS) for control and Gazebo** connecting code is been implemented using python code ROS simulation for pre-deployment testing. What process is happening in ROS showed in 3D model. Through these technologies, this study demonstrates the potential of robotics in agricultural automation and the practical steps towards achieving it.

Keyword- Internet of Things, Robotic Operating System (ROS), harvesting robots.

ETHICS IN EMERGING TECHNOLOGIES: NAVIGATING THE IMPACT OF DEEPFAKES AND GENERATIVE AI ON TRUTH AND TRUST

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Abstract

Emerging technologies, particularly deepfakes and generative artificial intelligence (AI), are reshaping our digital world, creating new possibilities while also introducing significant ethical concerns. These technologies, which are capable of generating hyper-realistic fake media, raise critical questions regarding truth, trust, and the potential misuse of such innovations. This paper explores the ethical implications of deepfakes and generative AI, emphasizing their impact on society's perception of truth, trustworthiness, and the challenges they pose to traditional information verification methods. Through an examination of ethical concerns, regulatory responses, and future directions, this paper seeks to provide a balanced overview of how these technologies influence societal norms and the need for ethical frameworks.

Keywords: Deepfakes, Generative AI, Ethics, Trust, Misinformation.

HANDWRITTEN INVOICE DATA EXTRACTION USING GEMINI 1.5 FLASH

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Abstract

The integration of Optical Character Recognition (OCR) and AI technologies has revolutionized invoice data extraction, replacing error-prone manual processing with automated systems. By leveraging Google's Gemini 1.5 Flash API, an advanced vision-based AI model, both handwritten and printed invoices can be automatically processed. This workflow extracts text via OCR, transforms unstructured data into structured formats using generative AI, and presents the information for verification before storage. The system's scalable architecture handles high document volumes with minimal latency while maintaining security through encryption protocols and compliance measures. This intelligent automation significantly improves speed, accuracy, and cost-efficiency in financial operations, driving digital transformation in document processing.

Keywords: OCR, AI-driven technologies, invoice data extraction, Gemini 1.5 Flash API, generative AI, intelligent automation, digital transformation.

A DEEP NEURAL NETWORK CLASSIFIER FOR FAKE NEWS DETECTION IN SOCIAL MEDIA

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Abstract

The widespread use of smartphones has led to a surge in social media usage, making it a primary platform for sharing news and ideas. However, this has also enabled the proliferation of fake news, often driven by personal or societal gain. Unlike previous research that relied solely on news article data, this study takes a holistic approach by analyzing both the content of news articles and the presence of echo chambers in social networks to detect false information. By leveraging a linked matrix-tensor factorization method, the proposed approach integrates news content with social network data, which is then used to train a Deep Belief Network (DBN) for fake news classification. The DBN employs a combination of unsupervised and supervised learning techniques, utilizing Contrastive Divergence and Back Propagation methods to optimize its performance. The effectiveness of this approach is validated using a fake news dataset from PolitiFact and BuzzFeed, with evaluation metrics including precision, recall, f-measure, and accuracy.

Keywords-Sentiment analysis, Fake news, social media, Deep Belief Network (DBN), Tensor decomposition.

ROBOTICS FOR WORKFORCE TRANSFORMATION

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Abstract

The rapid advancement of robotics and artificial intelligence (AI) is reshaping the modern workforce, transforming industries through automation, precision, and efficiency. This paper explores the role of robotics in workforce transformation, highlighting key applications across sectors such as manufacturing, healthcare, logistics, and agriculture. It discusses the evolution of robotics, current trends, and the shift towards human-robot collaboration. Additionally, the study examines future challenges, including job displacement, upskilling requirements, and ethical concerns. By analyzing case studies of successful robotic integration, the paper provides insights into how organizations can adapt to a robotic workforce while fostering innovation and sustainable employment.

Keywords-Robotics, workforce transformation, automation, AI, Industry 4.0, human-robot collaboration, smart manufacturing, job displacement, ethical AI.

AI FOR HEALTHCARE AND LIFE SCIENCE

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Abstract

Artificial Intelligence (AI)is been found everywhere and in everything. The advancement of AI is mind blowing and many countries have been emerged as a new founders of various AI application. This paper deals with the brief introduction about AI and its evolution in the past decades. It focuses on the concept of AI in healthcare as well as in life science which are correlated in nature. This paper also highlights the level of AI 's advancement in both the fields and the major tools used to develop and improve the lifestyle of the biotic factors. Most importantly it denotes the actual usage of artificial intelligence.

Keywords-Chatbots, Lifestyle factors, AI/ML algorithm, Healthcare, Life science, Path AI, Fraud detection, Disease diagnosis, Drug development, Robotic surgery ,Assistant not replacement.

ARTIFICIAL INTELLIGENCE IN E-WASTE SORTING: A SUSTAINABLE SOLUTION

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Abstract

The escalating volume of e-waste has emerged as the main developing problem, bequeathing on the world a great environmental and emotional risk due to improper disposal and recycling practices. Inefficiency and inaccuracy in manual sorting represent a major challenge in the recycling of e-waste. The paper advocates the use of artificial-intelligence-based automations to carry out sorting of e-waste disposal with image recognition systems in mind, actually training machine learning models in diverse electronic waste data sets so that they can check e-waste accurately when separating and identifying materials for recycling. Such an effort reduces human error, increases speed, and thus allows for increasing amounts of manifest e-waste to be processed in a sustainable manner. This research underlines how, with support from artificial intelligence, e-waste solutions are on the verge of revolutionizing the way e-waste is managed, though this continues to be a loop of waste generation and recycling of e-waste.

Keywords-E-waste management, Artificial intelligence, Image recognition, Waste sorting automation, Sustainability, Recycling technology.

ENHANCING AGRICULTURAL PRODUCTIVITY WITH IOT: A SMART SOWING AND IRRIGATION APPROACH

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Abstract

The integration of the Internet of Things (IoT) in agriculture has revolutionized traditional farming methods, improving efficiency, productivity, and sustainability. With the growing global population and increasing demand for food, modern agriculture must evolve to ensure higher yields and optimized resource utilization. IoT technology enables real-time data collection and analysis through interconnected sensors, providing valuable insights for farmers to make informed decisions. From precision farming to automated irrigation, livestock monitoring, and supply chain management, IoT plays a crucial role in addressing key agricultural challenges. This paper explores various applications of IoT in agriculture, its significant benefits, challenges associated with its adoption, and future trends that could further enhance smart farming. As digital transformation continues to reshape agriculture, IoT stands as a pivotal tool in ensuring food security, environmental sustainability, and improved farm management practices worldwide. Additionally, a proposed IoT-based smart farming system is discussed, incorporating a Bluetooth-enabled Arduino controller, humidity sensors, LCD display, servo motors, and a relay board.**Keywords-** IoT, Bluetooth, smart agriculture.

THE SURVEY OF NETWORK SECURITY CHALLENGES IN AD HOC NETWORKS

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Abstract

Ad hoc networks are decentralized and dynamic networks that rely on peer-to-peer communication without fixed infrastructure. While these networks offer flexibility and rapid deployment, they are vulnerable to various security threats. This paper explores the unique security challenges faced by ad hoc networks, including routing attacks, denial of service (DoS) attacks, node compromise, and key management issues. We analyze existing security mechanisms and propose potential improvements to enhance network security.

Keywords—Ad hoc networks, network security, routing attacks, denial of service, key management.

FORENSIC FACE SKETCH CONSTRUCTION AND RECOGNITION

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Abstract

In forensic science, traditional hand-drawn face sketches have proven to be both time-consuming and limited in their effectiveness, particularly when integrated with modern recognition and identification technologies. In this paper, we introduce a standalone application designed to empower users to create composite face sketches of suspects independently, without the need for professional forensic artists. This user-friendly application employs a drag-and-drop interface, allowing for intuitive design. Furthermore, it leverages advanced deep learning algorithms and cloud infrastructure to automatically match the generated composite sketches against police databases, significantly enhancing the speed and efficiency of the identification process.

Keywords-Forensic Face Sketch, Face Sketch Construction, Face Recognition, Criminal Identification, Deep Learning, Machine Locking, Two-Step Verification.

AI FOR HEALTH CARE AND LIFE SCIENCES

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Abstract

Artificial Intelligence (AI) is transforming the healthcare and life sciences industries by leveraging machine learning, deep learning, and natural language processing to analyze vast amounts of medical data. This enables faster and more accurate diagnoses, personalized treatment plans, improved research outcomes, and streamlined operations. AI-powered chatbots, virtual assistants, and cognitive molecule research are redefining patient care, clinical decision-making, and medical research. Despite challenges such as bias, privacy concerns, and regulatory hurdles, strategic implementation and collaboration can unlock AI's full potential, leading to enhanced patient outcomes, increased efficiency, and groundbreaking discoveries.

SYSTEM FOR AUTOMATIC NUMBER PLATE RECOGNITION

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Abstract

This paper introduces an advanced automatic number plate recognition (ANPR) system tailored to Qatar's varied license plate designs and challenging environmental factors. By utilizing the YOLOv8 deep learning model, specifically the YOLOv8s variant, we achieve cutting-edge accuracy in both license plate detection and number recognition. Our approach incorporates a dataset enhancement strategy that simulates difficult conditions, greatly enhancing the model's resilience in real-world settings. Additionally, we incorporate edge computing using a Raspberry Pi alongside server-side processing, providing an efficient solution for real-time ANPR applications. The system consistently performs above 93% across a range of environmental challenges, including nighttime and rainy conditions. We also examine the effects of various pre-processing methods, such as edge detection, k-means thresholding, DBSCAN, and Gaussian mixture models, on the system's performance. Our results show that modern deep learning models like YOLOv8 are robust enough to process raw images without the need for extensive pre-processing. With its impressive accuracy and real-time processing capabilities, the proposed system marks a major step forward in ANPR technology and is particularly well-suited to Qatar's distinct traffic management needs and smart city projects.

Keywords-ANPR systems; computer vision; image processing; machine learning; Qatari license plates; YOLOv8.

TECHNOLOGY AND THE ENVIRONMENT:AN OVERVIEW

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Abstract

Worldwide, issues such as global warming, resource depletion, and the rising volumes of solid waste have emerged as significant challenges for governments across the globe. This paper seeks to evaluate Malaysia's competitiveness in light of global environmental changes by examining companies that have integrated environmental technological innovation (ET innovation) into their business practices. It highlights the relationship between ET innovation and sustainable development while discussing the application of ET innovation at the organizational level. The firms included in this analysis have embraced a comprehensive approach to ET innovation in their environmental technology implementations. Additionally, these companies have aimed at international markets with their eco-friendly products and green technologies. Nevertheless, our findings indicate that they must adopt a more market-oriented approach in the development of their products and technologies to effectively meet market demands. Engaging in ET innovation necessitates substantial investment in research and development, along with effective resource management to achieve success.

Keywords-competitiveness in light, market-oriented, ET innovation, resource depletion, sustainable development.

AUTOMATICALLY DETECTING IMAGE- TEXT MISMATCH ON INSTAGRAM WITH DEEP LEARNING

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Abstract

Image-text content, in which text is frequently embedded within images to provide context or extra information, has increased due to the quick growth of social media platforms like Instagram. The image and the text that goes with it, however, may not match as a result of this technique, which could produce inaccurate or unnecessary content. In order to improve user experience, ensure the accuracy of shared information, and improve content quality, it is imperative to identify these mismatches. In this paper, a deep learning-based framework for automatically identifying Instagram image-text mismatches is proposed. For image feature extraction, our method uses Convolutional Neural Networks (CNNs), and for text comprehension, Transformer-based models. Combining these modalities allows us to capture both textual and visual semantics using a multi-modal architecture. We present a novel image-text alignment metric that assesses the semantic consistency between textual content and image features in order to identify mismatches. We assess our model's performance using a sizable dataset of Instagram posts that include pictures along with hashtags and captions. Results from experiments show

that our framework performs noticeably better than baseline techniques in correctly detecting mismatches, with gains in recall and precision. Memes, user-generated content, and promotional posts are just a few of the content types that the suggested solution can handle. This work improves the overall integrity of social media platforms by offering a useful tool for content moderation systems that allows automated detection of image-text pairs that are misleading or irrelevant.

Keywords-CNN, Transformer, Instagram, deep learning, image-text mismatch, and content

AI-DRIVEN SMART LOGISTICS FOR RURAL DEVELOPMENT

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Abstract

This work discusses an AI-driven smart logistics framework tailored for rural development. The system retrieves historical market data, accepts user input for product details, stock quantity, and destination, and then suggests optimal pricing, vehicle type, and route. By leveraging AI, this model enhances efficiency, reduces costs, and promotes economic growth in rural areas. The proposed system aims to streamline supply chain operations in rural regions by integrating predictive analytics, intelligent decision-making, and automated logistics planning. The paper highlights the methodologies, experimental results, and future enhancements required to scale the system effectively.

Keywords-Artificial Intelligence, Smart Logistics, Rural Development, Price Prediction, Route Optimization, Supply Chain Optimization.

SMART TECHNOLOGIES FOR CARBON FOOTPRINT REDUCTION: A PATH TOWARD ENVIRONMENTAL SUSTAINABILITY

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Abstract

Climate change remains one of the most critical global challenges, with carbon emissions significantly contributing to environmental degradation. Traditional carbon footprint reduction methods often lack efficiency, real-time monitoring, and predictive capabilities. With advancements in digital technologies, Artificial Intelligence (AI), the Internet of Things (IoT), and Big Data Analytics have emerged as effective tools for optimizing energy consumption, tracking emissions, and implementing sustainable practices. This paper explores how these smart technologies contribute to reducing carbon footprints by enabling predictive analytics, real-time monitoring, and data-driven decision-making. Additionally, real-world applications and case studies demonstrate their effectiveness in industries, urban planning, and policy development. Despite challenges such as high implementation costs and data privacy concerns, smart technologies offer a scalable and efficient solution for mitigating climate change. The study concludes with future recommendations for integrating AI, IoT, and big data in sustainability efforts.

AI FOR HEALTHCARE AND LIFE SCIENCE

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Abstract

Artificial intelligence or AI is constantly growing in today's world. AI is constantly and rapidly emerging in all fields especially healthcare. AI helps humans to predict the risk factors which in turn can suggest the possibility of a disease. AI in the present, assists doctors as well as patients. AI in the present world can help in cardiac management and also in psychological fields. By leveraging AI in healthcare, we can improve patient outcomes while enhancing patient's experiences. As AI is continuing to evolve, we can expect even more innovative applications and benefits in the healthcare sector. This paper aims to assess the role of AI in healthcare and also developing AI-powered personalized medicine systems that can help to customize treatment plans for individual patients according to their unique genetic profiles, medical histories, and lifestyle factors. From our research it is safe to conclude that as AI is constantly getting advanced each minute. It is safe to assume that AI would be a boon to healthcare due to its precision, and time management which can save many lives**.**

Keywords-Machine learning, Robotics, Advantage Cardiac management, Artificial Intelligence.

THE FUTURE OF EMBEDDED AND IOT: INNOVATION, CHALLENGES AND TRANSFORMATION

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Abstract

The integration of Embedded Systems and the Internet of Things (IoT) is reshaping industries, creating smarter, more efficient, and interconnected environments. Embedded systems serve as the brains of IoT devices, enabling automation, data processing, and real-time communication. From self-driving cars and wearable healthcare devices to smart cities, IoT is revolutionizing the way we live and work.Despite its advancements, IoT faces critical challenges such as security risks, data privacy concerns, and dependency on stable networks. With the rapid growth of 5G technology and AI-powered IoT, there is an urgent need to address these vulnerabilities while optimizing energy efficiency and device interoperability.T his paper explores the role of embedded systems in IoT, focusing on the real-world applications, security implications, and the future of smart technology. It highlights the importance of secure, scalable, and intelligent IoT solutions that enhance automation while maintaining privacy and efficiency. The findings suggest that with advancements in AI, blockchain security, and sustainable embedded systems, IoT is poised to revolutionize industries globally.

Keywords - Embedded Systems, IoT, Security, AI,5G, Smart Technology

SHOPPING REIMAGINED: THE FUTURE OF E-COMMERCE WITH AUGMENTED REALITY

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Abstract

This paper introduces an Augmented Reality (AR) Shopping Experience for a furniture website, revolutionizing the way customers shop for furniture online. The platform is designed to provide an intuitive and interactive shopping experience, featuring advanced search and filter options to help users quickly find their desired products. A standout feature of the website is its AR integration, allowing customers to view furniture items in 3D or visualize them directly in their real space using their mobile devices by simply scanning a QR code. This immersive experience helps users make informed purchasing decisions by understanding how each piece will fit and look in their environment. The website also includes a seamless ordering and payment process, enabling users to place orders and pay securely via PayPal. Additionally, customers can manage their purchases efficiently through a personalized profile section that provides a comprehensive overview of their order history and details. By combining innovative AR technology with user-friendly e-

commerce features, this project aims to bridge the gap between online and in-store furniture shopping, enhancing convenience, engagement, and satisfaction for modern consumers.

Keywords-Augmented Reality Shopping Experience, 3D, AR integration, PayPal.

SELLING & BUYING AGRICULTURAL PRODUCTS USING ANDROID APPLICATION

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Abstract

Farmers facing lot of problems, they will cultivate crops and other agricultural products(fruits, flowers, vegetables), They want to sell their products according to the market price but lack of knowledge they will sell their huge amount of products for small amount of money to the brokers available in the local and customers will directly approach to the brokers because of this farmers are losing lot of money, they are getting cheated, Farmers know that they are selling products to broker for small amount of money, but lack of knowledge to the farmer I thought of doing an application that can help farmers can directly sell their own products to customer with no broker, customers can directly contact to farmers ,Farmers can sell their own products retail or wholesale according to their quantity of production in the farming to the customer directly, To get aware of all these problems and to get knowledge to the farmers this application is needed and, To bring the choice to any kind of farmer to create an environment that will let them buy or sell their agricultural products, Languages used Java, Language available Hindi, English, Technologies using Android Application.

QUANTUM-ENHANCED IOT FOR SMART URBAN INNOVATION

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Abstract

The accelerated urbanization and increasing need for sustainable solutions have given birth to smart cities, where the Internet of Things (IoT) is at the forefront of revolutionizing urban life. IoT brings together a system of sensors, devices, and systems to gather and share data, allowing cities to function more effectively and enhance the quality of life for residents. This paper discusses the most important uses of IoT in smart cities, including smart traffic management, waste management, smart lighting, healthcare, and water management. It also addresses the most important advantages of IoT, which are improved resource management, energy efficiency, and public safety, and tackles the challenges of security, privacy, and interoperability. As smart cities proceed to develop, the confluence of IoT with new technologies like 5G, artificial intelligence, and blockchain will continue to speed up the possibilities of these city systems.

Keywords- IoT; Artificial intelligence; Blockchain; Quantum**.**

ARTIFICIAL INTELLIGENCE IN HEALTHCARE: BRIDGING OPPORTUNITIES AND RESOURCE

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Abstract

Artificial Intelligence (AI) is a subfield of computer science that focuses on the computational understanding of intelligent behavior. It has becoming increasingly prominent in various areas of computer science, significantly improving human life.AI has even surpassed human performance in certain domains, particularly in healthcare, where it holds the potential to enhance prevention, detection, diagnosis and treatment of disease. Notably, Ai is being utilized in major disease areas such as cancer, neurology, cardiology and diabetes. This review provides an overview of the current status of AI applications in healthcare, highlighting its ability to automatically identify issues such as medical imaging, drug discovery, robot-assisted surgery, remote monitoring and threats to patient safety with high accuracy and speed. Ongoing research in AI applications in healthcare offers a glimpse of a future where healthcare delivery is more cohesive and human-centered.

Keywords-Artificial Intelligence, Computer, Disease, Robot, Healthcare, Applications.

VIDEO STREAMING WEB APPLICATION INTERGRATED AI

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Abstract

The rapid evolution of video streaming has transformed digital content consumption, with platforms like YouTube, Netflix, and Amazon Prime Video dominating the industry. However, limitations persist in real-time personalization, intelligent search, and interactive user engagement. Traditional recommendation systems, reliant on collaborative filtering and content-based filtering, face cold-start problems and struggle with dynamic user preferences. Additionally, keyword-based search limits content discoverability, and the absence of AI-powered interactivity reduces engagement. To address these challenges, we propose an AI-integrated video streaming web application leveraging machine learning, deep learning, and natural language processing (NLP) to provide personalized recommendations, conversational AI search, automated video summarization, and a real-time chatbot assistant. Our system integrates React.js, Node.js, PostgreSQL, MongoDB, OpenAI's GPT-based chatbot, Lang Chain, Whisper API, WebRTC, and HLS streaming, ensuring a seamless, interactive user experience.

Keyword-NLP,AI, Chatbot.

IOT BASED HEALTH MONITORING SYSTEM

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Abstract

The advancement of wearable technology and the Internet of Things (IoT) has revolutionized healthcare by enabling real-time monitoring of patients. A Wearable Health Monitoring Network (WHMN) consists of interconnected devices that collect, analyze, and transmit health data for continuous patient assessment. This paper explores the architecture, working principles, applications, benefits, challenges, and future directions of WHMNs, highlighting their impact on modern healthcare.

Keyword-IOT, WHMN, Healthcare.

AUTOMATIC ANSWER CHECKER WITH MULTIPLE CHOICE QUESTION USING PYTHON

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Abstract

The increasing reliance on technology in education has led to the development of automated assessment systems. This paper presents an Automatic Answer Checker for Multiple-Choice Questions (MCQs) using Python. The system streamlines the evaluation process, reduces human effort, and ensures accuracy. Using libraries like pandas, NumPy, and OpenCV for OCR-based answer detection, this tool provides instant feedback, enhancing the learning experience.

Keyword-Technology, MCQ, Libraries, OCR.

ANOMALY DETECTION IN FIREWALL LOGS USING MACHINE LEARNING TECHNIQUES

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Abstract

A firewall retains traffic entering and departing the domain it was supposed to protect. The logging feature keeps track of how the firewall handles different sorts of traffic. Monitoring and analyzing log files can assist IT businesses improve the end-user reliability of their systems. Log files may consists of malicious texts, strings that tricks the users to hack the information, classifying the log files may help to observe more efficient, the number of unnecessary attributes can be minimized resulting in a more efficient performance. It checks that each data packet arrives on both sides of the firewall. It then decides whether or not to pass it. Firewalls can improve security even more by allowing quite well control over which system functions and processes have access to networking resources. The process starts with data collection followed by pre-processing techniques and main features to be selected to build a model using supervised machine learning algorithms. A feature selection method is integrated with feature selection approaches to increase the accuracy of

classification methods using various techniques, and then a comparative analysis is carried out to show the results.

Keywords – Classification, Firewall, Log files, Network Security, Protocols, Supervised learning

CRYPTOGRAPHY AND NETWORK SECURITY: ENSURING SECURE DIGITAL COMMUNICATION

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Abstract

Cryptography and network security are fundamental aspects of cybersecurity, ensuring secure data transmission, confidentiality, integrity, and authenticity. As digital networks expand, securing sensitive information from cyber threats becomes a priority for organizations, governments, and individuals. This paper explores key cryptographic techniques, network security protocols, emerging threats, and advancements in secure communication. It also discusses the role of artificial intelligence, quantum cryptography, blockchain, and ethical considerations in strengthening network security.

Keywords - Cryptography, Network Security, Encryption, Cyber Threats, Artificial Intelligence, Blockchain, Quantum Cryptography, Cybersecurity Protocols, Ethical Hacking, Secure Communication.

LEVERAGING DATA-DRIVEN INSIGHTS TO FORECAST CUSTOMER CHURN AND DEVELOP TAILORED RETENTION STRATEGIES WITH PREDICTIVE MODELS AND TARGETED ACTIONS

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Abstract

Churn prediction is vital in customer retention strategies, helping businesses proactively address customer dissatisfaction. In this research, we propose a comprehensive churn prediction model that addresses these challenges by integrating advanced techniques, including handling imbalanced data, feature relevance identification, new feature generation, incorporating temporal patterns, and personalized modeling for customer segments. By applying advanced techniques such as SMOTE-ENN for balancing, RFE-RF for feature elimination, and K-Means clustering for segmentation, the model improves predictive accuracy and provides actionable insights for targeted retention strategies. The proposed model effectively enhances prediction accuracy and provides actionable insights for customer groups, optimizing retention strategies. With the proposed Model Logistic Regression performs better across all segments in terms of AUC-ROC and precision particularly for high-value and frequent users with 0.91% and 0.80% respectively.

Keywords - Churn Prediction, Class Imbalance, Temporal Patterns, Customer Segmentation, Recursive Feature Elimination.

DATA-INFORMED CROP SYSTEMS: LEVERAGING MACHINE LEARNING TO ENHANCE INTERCROPPING AND CROP ROTATION STRATEGIES

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Abstract

This paper explores the integration of machine learning techniques in optimizing intercropping and crop rotation practices, which are essential for sustainable agriculture. Intercropping, the practice of growing two or more crops in proximity, and crop rotation, the systematic planting of different crops in succession, have been shown to enhance biodiversity, improve soil health, and increase crop yields. However, the complexity of these systems presents challenges in determining the optimal combinations and sequences of crops. By analysing various datasets related to agricultural productivity, soil health, and environmental conditions, we aim to develop predictive models that can enhance crop yields, improve resource efficiency, and promote sustainable farming practices. This research will utilize machine learning algorithms to identify patterns and relationships within the data, enabling farmers to make informed decisions about crop selection and management. The anticipated outcomes include increased agricultural productivity, reduced reliance on chemical inputs, and improved resilience to climate change, ultimately contributing to food security and environmental sustainability.

Keywords - Machine Learning, Intercropping, Crop Rotation, Sustainable Agriculture, Predictive Modelling, Agricultural Productivity, Resource Efficiency, Soil Health, Biodiversity, Crop.

COMPARATIVE ANALYSIS OF MACHINE LEARNING AND DEEP LEARNING APPROACHES FOR ARTIFICIAL INTELLIGENCE IN HEALTHCARE AND LIFE SCIENCE

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Abstract

Artificial Intelligence (AI) is revolutionizing healthcare and life sciences by enabling advanced diagnostics, predictive analytics, and personalized treatment strategies. Machine Learning and Deep Learning, two AI-driven technologies, have significantly improved disease detection, drug discovery, and patient care. Machine Learning analyses large datasets, while Deep Learning processes complex medical data like medical images and EHRs.

Keywords - Machine learning, Deep learning and Artificial Intelligence.

ROLE OF AI IN CYBER SECURITY

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Abstract

Artificial Intelligence (AI) Displaying a transformative role in cybersecurity, enhancing threat detection, automating incident responses, and strengthening risk assessment mechanisms. As cyber threats become more sophisticated, traditional security measures are proving insufficient. AI-driven systems analyze vast datasets in real time, identify anomalies, and predict potential cyber-attacks with high accuracy. This paper explores the integration of AI in cybersecurity, covering various methodologies, applications, benefits, and challenges. It also discusses the risks associated with adversarial AI, data privacy concerns, and the need for a balanced human-AI approach. The findings suggest that AI-driven cyber security solutions can significantly reduce security breaches, but ethical and regulatory challenges must be addressed for optimal implementation.

LUNG CANCER DETECTION USING DEEP LEARNING

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Abstract

Lung cancer remains one of the most prevalent and lethal diseases worldwide. Early detection is pivotal for effective intervention and improved survival rates. This project employs state-of-the-art deep learning algorithms to enhance lung cancer detection, contributing to the broader field of medical image analysis. The study compares the performance of three distinct algorithms: A Simple Feed Forward Neural Network (SFNN), an in-built MLP Classifier, and a custom-built MLP Model. Each of these algorithms processes histopathology images of the lung for classification into two categories: "Cancer Affected" and "Healthy Lungs."

Results indicate that the in-built MLP Classifier achieves the highest accuracy at 99.4%, offering a promising solution for practical implementation in clinical settings. The custom-built MLP Model closely follows with an accuracy of 92.4%, demonstrating the potential for customized deep learning solutions in medical imaging. Meanwhile, the SFNN Model achieves an accuracy of 77.3%, underscoring the importance of algorithm selection in optimizing lung cancer detection. These findings provide valuable insights into the application of deep learning in lung

cancer diagnosis, emphasizing the importance of algorithm choice in achieving optimal results.

ADVANCES IN TECHNOLOGY - WOMEN SAFETY APP: A CRUCIAL ASPECT OF SUSTAINABLE DEVELOPMENT

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Abstract

The usage of smart phones equipped with GPS navigation unit have increased rapidly from 3% to more than 20% in the past five years through offline. Hence, a smart phone can be used efficiently for personal safety or various other protection purposes especially for women. This app can be activated by a single click when the user feels she is in danger. This application communiqués the user's location to the registered contacts for every few seconds in the form of message. Thus, it acts like a sentinel following behind the person till the user feels she is safe. This paper presents analysis a unique feature of this application to send the message to the registered contacts continuously till they are pressing 'HELP' button. Continuous location tracking information via SMS helps to find the location of the victim quickly and can be rescued safely. This application aims to ensure women safety. This is achieved by addressing the circumstances that compromise the safety of women in today's day and age. This app ensures women are not put into such situations through various features offered by our system.

Keywords - Smart Phone, Offline service, Android, Registered Contacts, GPS location, database, URL.

LIVER DISEASE PREDICTION USING MACHINE LEARNING

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Abstract

Machine Learning is a process that is employed to find patterns in enormous data/large data set to facilitate decision, hence making machines learn through a learning process (i.e. supervised, unsupervised and semi-supervised or reinforced). The data set utilized in this paper is Liver Patient from UCI Repository (i.e. Supervised Learning). There is abundant data of patients who are getting medical examination in hospitals and these data have been extracted on liver patients whose information can be utilized further for improvement of their condition in the future. In other words, past and classified input of patients and output data are input to various algorithms or classifiers for forecasting future data of patients. The algorithms utilized here for forecasting liver patients are Logistic regression, Decision Tree, Random Forest, KNNeighbour, Gradient Boosting, Extreme Gradient Boosting, LightGB. As per the analysis and result calculation, it was observed that these algorithms had achieved good accuracy after feature selection.

Keywords - Liver Disease, Chronic diseases, Data Analysis, Machine Learning Algorithms.

GRAPH NEURAL NETWORKS FOR SOCIAL MEDIA TREND ANALYSIS REAL-TIME MISINFORMATION DETECTION FOR SUSTAINABLE DEVELOPMENT

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Abstract

The proliferation of misinformation on social media threatens the credibility of information, impacting Sustainable Development Goals (SDGs). This paper presents a novel approach using Graph Neural Networks (GNNs) for real-time misinformation detection, combined with Explainable AI (XAI) techniques for enhanced interpretability. Our framework integrates Transformers (BERT/T5) for textual analysis, SHAP/LIME for transparency, and Federated Learning (FL) for privacy preservation. Experimental results demonstrate that the proposed model outperforms existing misinformation detection techniques, ensuring both high accuracy and explainability. This research contributes to AI-driven trend analysis for sustainable digital governance.

Keywords - Graph Neural Networks, Misinformation Detection, Social Media, Explainable AI, Sustainable Development, Transformers, Federated Learning.

A SURVEY ON BIG DATA ANALYTICS: CHALLENGES, OPEN RESEARCH ISSUES, TOOLS, REAL-WORLD APPLICATIONS, TECHNOLOGIES AND INTEGRATION OF AI AND BIG DATA

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Abstract

An enormous volume of terabytes of data is produced daily through modern digital technologies such as the Internet of Things (IoT) and cloud computing. Deriving meaningful insights from this vast data requires multi-tiered efforts. This paper examines the challenges of big data, open research issues, tools, real-world applications, emerging technologies, and AI integration, serving as a foundation for future research.

Keywords - Big data analytics; Hadoop; Massive data; Structured data; Unstructured data.

SAFE DRIVING USING IOT SENSOR

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Abstract

All over the world, most of the road accidents are occurred by drunk and driving and rash driving. The main concept of this paper is to prevent the road accident so to prevent the road accident we are using alcohol detection sensor, eye blink sensor, over speed control sensor. The alcohol sensors are used to detect the driver is drunk or not. The eye blink sensors are used to check the driver is sleepy or not with the help of the eyeball movement of the driver, if the driver is sleepy means it will trigger the alarm to conscious the driver. The over speed controller sensors is used to check the car is over speed or not and if the car is over speed means it will reduce the speed of the car & maintain the car speed into normal speed. In this process, the message or SMS will send to the relative of the driver if the driver is consuming alcohol & driving and the message will also send to the local police to prevent the accident.

Keywords - Safe Driving, IOT Sensors, alcohol, accidents.

EARLY-ONSET POLYCYSTIC OVARY SYNDROME(PCOS) IN ADOLESCENTS: UNDERSTANDING RISKS, IMPLICATIONS, AND MANAGEMENT STRATERGIES

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Abstract

PCOS is a common hormonal condition in adolescent girls, and early understanding and management are crucial for overall health and well-being. Beyond immediate symptoms like menstrual irregularities and hyperandrogenism, adolescent PCOS poses long-term risks, including infertility, metabolic disorders, and psychological distress. The lack of age-specific diagnostic criteria further complicates early detection. Effective management requires a multidisciplinary approach integrating lifestyle modifications, medical therapies, and psychological support. This article examines the key risk factors, challenges faced by PCOS affected person, strategies for effective management.

Keywords - PCOS, PCOS in Adolescents, Risk factors, Challenges, Management Strategies.

VOICE RECOGNITION USING SVM & NLP

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Abstract

Artificial Intelligence (AI) in voice assistance represents a transformative integration of natural language processing (NLP), machine learning (ML), and speech recognition technologies, facilitating human-computer interaction through spoken language. This comprehensive exploration of AI in voice assistance delves into its evolution, technological frameworks, practical applications, inherent challenges, and future trajectories. Voice assistance technology, driven by advancements in AI, has transitioned from rudimentary speech recognition systems to sophisticated virtual assistants capable of understanding and responding to natural language queries. Pioneered by systems like IBM's Shoebox in the 1960s and significantly advanced by contemporary assistants such as Apple's Siri, Amazon's Alexa, and Google Assistant, the field has seen exponential growth. These systems utilize AI to provide hands-free interaction, transforming user experience in both personal and professional domains.

Keywords - Development of AI, Core Technologies, Applications, Challenges, Speech Recognition

ENHANCING IT AGILITY WITH CLOUD COMPUTING AND VIRTUALIZATION

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Abstract

In the digital era, organizations must continuously adapt to evolving business demands, market changes, and technological advancements. IT agility—the ability to rapidly develop, deploy, and manage IT resources—has become a crucial factor in achieving business success. Cloud computing and virtualization have emerged as transformative technologies that enhance IT agility by providing scalable, flexible, and cost-efficient solutions. Cloud computing enables organizations to access computing resources on demand, reducing infrastructure costs, improving operational efficiency, and fostering innovation. Virtualization complements cloud computing by optimizing hardware utilization, streamlining resource management, and enabling rapid provisioning of IT services. By leveraging cloud-based infrastructure models such as Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS), businesses can deploy applications faster and ensure seamless scalability. Additionally, virtualization technologies, including server, storage, and network virtualization, allow IT teams to dynamically allocate resources, enhance security, and improve disaster recovery strategies.

Despite these advantages, challenges such as security concerns, compliance requirements, and integration complexities must be addressed to maximize the benefits of cloud computing and virtualization. This paper explores the role of these technologies in enhancing IT agility, analyzing their impact on business efficiency, innovation, and resilience. It also discusses best practices for organizations to effectively implement cloud and virtualization strategies while mitigating potential risks. By embracing these advancements, businesses can achieve greater flexibility, responsiveness, and long-term competitiveness in an increasingly digital world.

Keywords - Cloud Computing, IT Agility, Virtualization, Hybrid Cloud, Multi-Cloud Strategy, Scalability Elasticity, Resource Optimization.

ENHANCING ACCESS CONTROL MECHANISMS IN CLOUD SYSTEMS FOR IMPROVED SECURITY AND EFFICIENCY

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Abstract

In this paper, increasing adoption of cloud computing, ensuring robust access control mechanisms has become a critical aspect of securing cloud environments. Traditional access control models often struggle to balance security, scalability, and efficiency, leading to vulnerabilities such as unauthorized access and data breaches. This paper explores advancements in access control mechanisms for cloud systems, focusing on innovative approaches that enhance security while maintaining operational efficiency. Role-Based Access Control (RBAC), Attribute-Based Access Control (ABAC), and policy-based models are evaluated for their effectiveness in dynamic cloud environments. Emerging technologies such as blockchain, artificial intelligence (AI), and zero-trust architecture are also examined for their potential to strengthen access control mechanisms. The study highlights the importance of adaptive access control strategies that integrate machine learning for anomaly detection and real-time threat mitigation. Furthermore, the paper discusses the challenges associated with implementing stringent access controls, including performance trade-

offs, compliance requirements, and user experience considerations. Case studies and comparative analyses illustrate how modernized access control frameworks can mitigate security risks while optimizing resource allocation and minimizing administrative overhead. By adopting enhanced access control mechanisms, cloud service providers can achieve a higher level of security and efficiency, ensuring data protection and compliance with regulatory standards. This research provides insights into best practices and future trends, contributing to the ongoing development of secure and scalable cloud computing environments.

Keywords - Cloud System, Cloud Security, Role-Based Access Control, Attribute-Based Access Control.

UNLOCKING THE POWER OF CLOUD COMPUTING AND VIRTUALIZATION: A COMPREHENSIVE REVIEW AND ANALYSIS

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Abstract

The advent of cloud computing and virtualization has revolutionized the way organizations approach computing and resource allocation. Cloud computing provides on-demand access to a shared pool of computing resources, while virtualization enables the creation of multiple virtual machines on a single physical host. This paper provides a comprehensive review and analysis of cloud computing and virtualization, highlighting their benefits, challenges, and future directions. We explore the key characteristics, deployment models, and service models of cloud computing, as well as the different types of virtualizations, including server, desktop, and application virtualization. Our analysis reveals that the integration of cloud computing and virtualization can provide significant benefits, including improved resource utilization, increased flexibility, and enhanced scalability. However, we also identify several challenges and limitations, including security concerns, vendor lock-in, and the need for specialized skills. Finally, we discuss future directions for

cloud computing and virtualization, including the emergence of new technologies, such as containerization and edge computing.

Keywords - Cloud computing, virtualization, resource allocation, scalability, flexibility, security.

INTERNET OF THINGS (IOT) FOR NEXT GENERATION SYSTEMS: CHALLENGES, TRENDS, AND OPPORTUNITIES IN EMERGING 5G-IOT SCENARIOS

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Abstract

These days, the Internet of Things (IoT) is pervasive. Examples include augmented reality, high-definition video streaming, self-driving cars, smart environments, e-health care, and more. Large bandwidth, increased capacity, low latency, high throughput, and higher data rates are all necessary for these applications. IoT has transformed the world by enabling smooth connectivity between heterogeneous networks (HetNets) in light of these new ideas. The ultimate goal of the Internet of Things is to develop plug-and-play technology that offers end users convenience, remote access control, and configurationability. The IoT technology is presented in this paper from an overview, including its use cases, challenges, statistical and architectural trends, and potential future developments. In addition to providing a thorough analysis of these important enabling technologies, this paper addresses the new and developing applications of 5G-IoT that are being fuelled by developments in AI, machine learning, and deep learning, as well as ongoing 5G projects, quality of service (QoS) requirements in 5G, and standardisation concerns. Finally, the paper addresses the difficulties in implementing 5G-IoT because of the high data rates that necessitate the use of both cloud-based platforms and edge computing based on IoT devices.

AI-POWERED CYBER THREAT INTELLIGENCE: A PREDICTIVE ANALYTICS APPROACH FOR ADVANCED ATTACK DETECTION

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Abstract

The increasing sophistication of cyber threats necessitates advanced, AI-driven solutions to enhance threat intelligence and response mechanisms. This paper presents a predictive analytics approach leveraging artificial intelligence to detect, analyze, and mitigate cyberattacks in real-time. By integrating machine learning, deep learning, and federated learning, the proposed model enhances accuracy in threat detection while minimizing false positives. A key innovation of this study is the use of Generative Adversarial Networks (GANs) for adversarial attack simulation, improving the model's robustness against evolving threats. Additionally, federated learning ensures privacy-preserving threat intelligence sharing across distributed networks. Empirical results demonstrate a significant improvement in identifying zero-day attacks, reinforcing cybersecurity resilience. The findings highlight the efficiency of AI-powered automation in reducing response times and strengthening proactive security measures. This research contributes to the growing field of AI-driven cyber security, offering a scalable and adaptive framework for next-generation threat intelligence systems.

Keywords - Cyber Threat Intelligence Federated Learning, Generative Adversarial Networks, Zero-Day Attacks, Automated Threat Response.

ONLINE PAYMENT FRAUD DETECTION USING MACHINE LEARNING TECHNIQUES

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Abstract

The rapid expansion of digital transactions has increased the risk of online payment fraud, leading to significant financial losses. Traditional fraud detection systems rely on rule-based mechanisms that fail to adapt to evolving fraudulent tactics. This research explores the implementation of machine learning models for fraud detection, analyzing their accuracy and efficiency. Various classification algorithms, including Decision Tree, Random Forest, Naïve Bayes, and XGBoost, are evaluated to identify fraudulent transactions. The study finds that XGBoost provides the highest accuracy, demonstrating its capability to detect complex fraud patterns effectively. The results highlight the potential of machine learning in enhancing security measures in online financial systems.

Keywords - Online Payment, Fraud Detection, Machine Learning, XGBoost, Classification Algorithms

COMPREHENSIVE MERN STACK PLATFORM FOR MONITORING AND IMPROVING HIGHER EDUCATION STUDENT PERFORMANCE

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Abstract

The DSHEP is an online Web Application designed to improve the management of academic activities within educational institutions. It aims to provide administrators, educators, and students with a perceptive interface that facilitates interactions and manages data efficiently. To accomplish this, the system is created using a modern technology stack. The Frontend is developed with React.js, allowing a dynamic and responsive user experience, and Node.js and Express are utilized for the Backend, providing a server-side framework that handles requests and processes data efficiently. The database, MongoDB, provides scalable and adaptable data storage. Numerous capabilities are included in the AMS to support crucial operations. Such as Student and Faculty Data management, Attendance monitoring for students, monitoring student's marks, course management, event management, and mentorship tracking for monitoring students. A robust RESTful API provides access to these features, guaranteeing smooth front-end and back-end interactions.

Keywords - Academic, MIS, Node.js, Express, MongoDB, React, API, Authentication, Course Management, Attendance, Events, Mentorship, Security, Scalability.

PREDICTING CARDIOVASCULAR RISK USING MACHINE LEARNING

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Abstract

Heart diseases, usually referred to as cardio vascular diseases, are a broad category of disorders that impact the heart. These range from congenital heart anomalies to blood vessel illnesses and cardiac rhythm issues. For the past few decades, it has been the leading cause of death globally. It is imperative to find a trustworthy and accurate method for automating the work of early disease diagnosis in order to accomplish effective management of the condition. Processing massive volumes of data in the medical sciences is made possible in part by data science. To evaluate massive data sets and help with accurate cardiac illness prediction, researchers employ a variety of data mining and machine learning techniques. In order to provide a comparative analysis for the most effective approach, this work examines the supervised learning models of Support Vector Machine (SVM), K-Nearest Neighbours (KNN), Random Forest (RF), and the ensemble technique of XGBoost (XGB). It is discovered that, when compared to other algorithms, Random Forest offers the highest accuracy at 86.89%.

Keywords - Heart disease prediction, Random Forest (RF), XGBoost (XGB), K-Nearest Neighbour (KNN), Support Vector Machine (SVM).

THE ROLE OF SOCIAL MEDIA IN PROMOTING SUSTAINABILITY

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Abstract

Social media and sustainability are becoming more connected today. Social media platforms have a powerful role in spreading messages about protecting the environment and encouraging people to adopt eco-friendly habits. These platforms allow influencers, companies, and individuals to share ideas, raise awareness, and inspire action on issues like climate change and resource conservation. However, there are challenges, such as misinformation, fake environmental claims (greenwashing), and the need for responsible use of these platforms. This abstract looks at how social media can help promote sustainability but also highlights the importance of using these tools ethically to create a positive impact on the planet and society.

Keywords - Sustainable, social media, Digital activism, Eco friendly practices,Green marketing , Environmental science ,Digital marketing, Ecoinfluencer.

DESIGN AND IMPLEMENTATION OF VIRTUALIZATION CLOUD COMPUTING SYSTEM INTELLIGENT TERMINAL APPLICATION LAYER

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Abstract

Cloud task scheduling has gained popularity, and mathematical models of various cloud task scheduling scenarios can be used to optimize the drawbacks of conventional scheduling techniques. This research suggests an enhanced krill swarm optimization technique based on adaptive weight to enhance the virtualization data processing effect of the intelligent terminal application layer. The task scheduling algorithm's accuracy and convergence are increased by optimizing the task average response time ratio and cluster load balancing. Additionally, tests are conducted in this work to confirm the efficacy of the suggested model using the CloudSim simulation tool. Furthermore, this study suggests an application-based virtualization technique that turns the host computer's application programs into virtualization software within the virtual system. in order for the virtual machine to have access to it. Lastly, this study uses tests to confirm the validity of the suggested approach, offering a theoretical framework for the development of an intelligent terminal application layer virtualization cloud computing system. The creation and deployment of

applications are greatly facilitated by the greater flexibility, efficiency, and security of virtual machine hardware when compared to the conventional method of employing physical hardware.

Keywords-cloud computing, virtualization, application layer, and intelligent terminal.

FIRE DETECTION USING CNN MODEL

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Abstract

The project "Fire Detection Using CNN Model" is designed using Python as front end and MySQL as back end.Fire detection has recently played a crucial role in reducing fire losses. Therefore, early fire detection with high sensitivity and accuracy is essential to reduce fire losses. The aim of our work was to develop to an application capable of detecting fire in images, which is robust and works in any environment. Objective of the proposed system is to provide a user-friendly application to detect fire effectively without any Sensor Device. Proposed application CNN is used to classify the region of interest to either real fire or non-fire. Image recognition algorithms based on convolutional neural networks (CNNs) can automatically learn and extract complex image features effectively. This kind of algorithms has attracted great concerns and achieved excellent performance. The intention of this project is to minimize the manual interaction. First, background subtraction is applied, because the fire boundaries continuously change. Second, a colour segmentation model is used to mark the candidate regions. Finally, CNN (Convolutional

neural network) is used for classifying the candidate regions to either actual fire or non-fire. Whenever actual fire incident happen this application automatically sends the Mail alert intimation to forest department.

Keywords-CNN, Image Recognition, manual interaction, colour segmentation, Mail alert.

ETHICS AND CHALLENGES IN AI FOR BUSINESS ANALYSIS

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Abstract

Artificial Intelligence (AI) has revolutionized business analytics by enhancing decision-making, automating processes, and uncovering valuable insights from vast datasets. However, its integration presents significant ethical concerns and operational challenges. This paper explores key ethical issues such as data privacy, algorithmic bias, transparency, and accountability in AI-driven business analytics. It also examines challenges related to data quality, interpretability, regulatory compliance, and the potential displacement of human workers. By analyzing real-world cases and emerging frameworks, this study highlights the need for responsible AI development and governance. We argue that businesses must adopt ethical AI principles and robust policies to ensure fair, unbiased, and socially responsible analytics solutions. Future research should focus on balancing AI innovation with ethical considerations to foster trust and long-term sustainability in business applications.

Keywords- Artificial Intelligence, Business Analytics, Ethics, Algorithmic Bias, Transparency, Responsible AI.

ENERGY OF EXTENDED REVERSE R INDICES IN FUZZY GRAPHS

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Abstract

In this paper, the new concepts of extended reverse R indices, hyper extended reverse R index, fuzzy extended reverse R index matrix and energy of fuzzy extended reverse R indices and fuzzy hyper extended reverse R index are introduced and proved that FE $R_r^{(3)}$ is equal to its square value of $2(FHER$ $2(FHER$. Also, the upper bound and lower bound of FE R_r^C R_r^C are obtained with the use of Cauchy-Schwartz inequality. Finally, some bounds for fuzzy extended reverse R index energy are proposed with illustrations.

Keywords-Extended reverse R indices, fuzzy extended reverse R index matrix, energy of fuzzy extended reverse R indices and fuzzy hyper extended reverse R index.

BUSINESS INTELLIGENCE APPLICATION FOR IMPROVING THE PERFORMANCE OF BUSINESS OPERATIONS

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Abstract

Business Intelligence (BI) is a tool that empowers organizations to gather, analyze, and visualize data in order to facilitate decision-making. In management, BI improved the strategic planning, operational efficiency, and performance monitoring by offering real time insight into the main commercial matrix. It looks into BI application in sales and paper management, finance, supply chain, human resources and customer relationship management. Data mining, pre-protection, real-time reporting, and dashboard visualization are techniques that empower managers to make resourceful decisions and increase commercial performance based on data. The professional environment has evolved to an extent where integrating two or more tools and technologies has become a necessity for competitive gains. BI gives insight into better forecasting, risk management, and process automation which in turn improves productivity and profitability of an organization. This research highlights BI's role in management and how it impacts an organization's success. With the support of a BI tools, managers and business can derive feasible decisions as to increase productivity and achieve success of the company. Through instant data analysis, business forecasting, and KPI monitoring, businesses can improve over their rivals.

Keywords-Business Intelligence, Human Resources Management, Optimization of Resource Allocation, Business Operations, Resource Mobilization.

A COMPREHENSIVE SURVEY ON RECENT TRENDS IN DATA AUGMENTATION METHODS ON MEDICAL IMAGES

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Abstract

For machine learning systems to perform well, a lot of data is necessary. A significant amount of time and resources are spent on the manual data collection and labeling process. **Data augmentation** is a collection of techniques that apply numerous functions to existing data to produce high-quality images. Improving the **quantity, variety, and caliber** of training data is the primary goal of data augmentation . Data augmentation methods are comes under two classes , **traditional and advanced**. The traditional image augmentation algorithms covered in this survey include **geometric transformation, affine transformation, non- affine transformation, and photometric transformation**. **Deeply learned transformation and region level augmentation** are the two categories of advanced methods. The various conventional and cutting-edge techniques for data augmentation will be represented in this survey. Additionally, readers will comprehend how data augmentation improves the training data's quality.

Keywords-Data Augmentation, geometric transformation, affine transformation, non-affine transformation, and photometric transformation. Deeply learned transformation and region level augmentation.

A COMPREHENSIVE SURVEY ON SOFTWARE FAULT PREDICTION MODELS: TRENDS, TECHNIQUES, AND FUTURE DIRECTIONS

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Abstract

Software Fault Prediction (SFP) plays a critical role in improving software reliability by identifying fault-prone modules before deployment. Over the years, various **machine learning, deep learning, and statistical models** have been explored to enhance fault prediction accuracy. This survey provides a **comprehensive analysis** of existing SFP models, categorizing them into traditional machine learning approaches (e.g., Decision Trees, SVM, Random Forest), deep learning techniques (e.g., CNNs, RNNs, Transformers), and emerging **Large Language Model (LLM)-based** predictors. We examine the effectiveness of these models in handling **imbalanced datasets, feature selection challenges, and evolving software repositories**. Furthermore, we discuss the impact of software metrics, such as code complexity, change history, and defect density, on fault prediction performance. Through a comparative analysis of relevant studies, we highlight the **strengths, limitations, and future directions** in SFP research, emphasizing the potential of **hybrid AI-driven approaches** to enhance predictive accuracy. This survey serves as a valuable resource

for researchers and practitioners aiming to develop robust fault prediction models in modern software engineering.

Keywords: Software Fault Prediction, Large Language Models, Generative AI, Machine Learning

NOVEL SOLUTION FOR EXECUTION CHALLENGES OF STREAMING PLATFORM

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Abstract

Streaming, platforms nowadays we tend to handle the process of event streaming Apart from event streaming we publish and subscribe to streams of records and store streams of records in the order they were generated, Think of it like a messaging system, but designed for high volumes of data. It keeps a reliable, ordered record of data. Process streams of records in real-time, It enables you to analyze and react to data as it's happening. "Event streaming," which means it handles continuous flows of data. This is different from traditional databases that store static data.The data streaming platform runs on a cluster of servers, making it highly scalable and fault-tolerant. This means it can handle massive amounts of data and keep running even if some servers fail. There are challenges to be met to provide better services, In this work multi-level challenges are identified and solutions are recommended, In general, the challengers are in the form of complexity, scalability, and security breach challenges. Reliability issues and cost management, listed problems are met with the recommended solutions.

Keyword- Data streaming, Challenges, Data storage , Mean Time To Resolution.

CLOUD COMPUTING AND VIRTUALIZATION FOR SUSTAINABLE DEVELOPMENT GOALS

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Abstract

This paper explores the role of cloud computing and virtualization technologies in promoting sustainable development. It highlights the benefits of these technologies in enhancing energy efficiency, resource optimization, and digital inclusion, contributing to various Sustainable Development Goals (SDGs). The paper discusses the significant impact of cloud computing and virtualization on reducing energy consumption and carbon emissions, showcasing case studies of organizations that have achieved substantial energy savings. It also examines how these technologies optimize resource allocation and utilization, providing cost-effective solutions for businesses, especially small and medium-sized enterprises (SMEs). Furthermore, the paper delves into the potential of cloud-based platforms to bridge the digital divide by offering accessible and affordable digital services in education and healthcare. The critical role of cloud computing in disaster recovery and business continuity is also highlighted, demonstrating its contribution to building resilient communities. The paper addresses the challenges associated with cloud computing, such as security and privacy concerns, and provides insights into future research directions. Overall, cloud computing and virtualization are powerful enablers of sustainable development, and their continued innovation and adoption can drive significant progress towards a more sustainable and equitable world.

Keywords-Cloud Computing , virtualization, SDG, SMEs

ENHANCING WIRELESS VR/AR WITH AI-POWERED PREDICTIVE RENDERING AND ADAPTIVE STREAMING

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Abstract

The development of Virtual Reality (VR) and Augmented Reality (AR) has accelerated the demand for high-performance, lightweight, and wireless VR systems. However, existing solutions suffer from high bandwidth requirements, latency issues, and computational constraints. This paper proposes an AI-powered Predictive Rendering (AIPR) and Adaptive Multi-User Streaming (AMUS) framework to enhance wireless VR/AR. By leveraging deep learning for motion prediction and dynamically optimizing streaming, the system achieves 60% bandwidth reduction and 35% lower latency. We review existing wireless VR architectures, present our AI-driven solution, and validate its performance through experiments. The proposed framework significantly enhances user experience, making wireless VR/AR more scalable and efficient.

Keywords-VR,AR,AIPR,AMUS**.**

SURVEY ON THE APPLICATION OF ARTIFICIAL INTELLIGENCE TECHNOLOGY IN CLOUD COMPUTING ENVIRONMENT

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Abstract

The ongoing advancements in contemporary computer science, mobile internet, and various information technologies have rendered artificial intelligence (AI) a well-established field. The primary areas of artificial intelligence research encompass deep learning, natural language processing, computer vision, intelligent robotics, automated programming, and data mining, among others. These applications hold substantial practical significance and exert a profound influence on both industrial production and everyday life. The swift evolution and enhancement of AI have notably transformed the daily experiences of individuals, increased work efficiency, and fostered the robust development of economic and social civilization, as well as the advancement of information technology. However, the widespread application of AI presents challenges for traditional network information and big data processing technologies, which often struggle to meet its evolving requirements. To maximize the potential of AI technology and facilitate its growth, it is essential to integrate cloud computing with other technological advancements. This paper seeks to explore the integration of artificial intelligence technology

within cloud computing resource management, investigate reliability indicators, and propose a method for verifying the reliability of services at the infrastructure-as-a-service level It also providing an intuitive understanding of whether the performance of each server aligns with the commitments outlined in the service level agreement (SLA) of the cloud service provider.

Keywords-Artificial Intelligence, Cloud Computing , Cloud Service Provider , Service Level Agreement,Virtualization.

VOICE ANALYSIS USING MACHINE LEARNING ALGORITHMS

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Abstract

In the realm of healthcare, early detection of Parkinson's disease (PD) holds immense significance for effective intervention and management. This work endeavours to exploit the capabilities of machine learning algorithms to analyze voice data for the detection of Parkinson's disease. By employing three distinct algorithms - logistic regression, random forest classifier, and decision tree classifier - the study aims to discern the most accurate predictive model. The work commences with meticulous data preprocessing to handle features extracted by the voice data efficiently. Extracted features from these recordings serve as inputs for the machine learning models. Through rigorous experimentation and evaluation, the algorithms' performances are assessed based on their accuracy in predicting Parkinson's disease from voice data. Furthermore, the work culminates in the development of a user-friendly interface, facilitating easy access to the highest accuracy model. Users can input voice recordings, and the interface provides instant predictions regarding the presence of Parkinson's disease. Parkinson's disease (PD) is a neurodegenerative disorder that affects a significant portion of the global

population. Early detection of PD is crucial for timely intervention and improved patient outcomes. This work detects the Parkinson's disease using voice data. Voice characteristics are known to be affected in individuals with Parkinson's disease, exhibiting distinctive patterns related to speech, pitch, and vocal quality. Leveraging machine learning techniques, a predictive model is developed using voice features extracted from individuals with and without PD. The model is trained on a dataset comprising voice recordings with some features. The proposed system incorporates a three-machine learning model which are Decision Tree Classifier, Random Forest Classifier and K-Nearest Neighbour and to identify which algorithm gives the best accuracy. Additionally, with the trained model we can give the feature values and predict if the person affected with Parkinson's or not.

Keywords-Machine Learning, Voice Analysis , Disease Prediction, Parkinson's disease, Classification.

ANALYZING AND EXPLAINING BLACK-BOX MODELS FOR ONLINE MALWARE DETECTION

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Abstract

In recent years, considerable research efforts have been dedicated to evaluating the efficacy of machine learning (ML) models in the realm of malware detection. These methodologies have encompassed a spectrum of techniques, from simpler models like decision trees and clustering to more sophisticated approaches such as support vector machines (SVM) and deep neural networks. Notably, neural networks have demonstrated remarkable effectiveness in identifying intricate and advanced forms of malware. However, this effectiveness is accompanied by a significant drawback. Neural networks are inherently complex, leading to decisions that are frequently accepted without a thorough understanding of the rationale behind them. The opaque nature of these models has prompted researchers to investigate methods for elucidating the decision-making processes of black-box models, including SVM and neural networks. Achieving transparency and explainability is crucial for instilling confidence and trust among experts and malware analysts regarding the decisions made by ML models. Furthermore, it facilitates the creation of detailed reports that can enhance the sharing of cyber threat intelligence.

Keyword-ML,SVM, Nural Networks.

BLOCKCHAIN-BASED SUPPLY CHAIN INFORMATIONSHARING MECHANISM

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Abstract

This paper introduces a method for managing supply chain information operations utilizing blockchain technology to address the existing deficiencies in business information sharing within the supply chain. The proposed strategies encompass the application of blockchain to facilitate the sharing of supply chain information, the development of a blockchain-based architecture for production enterprises, and the establishment of a hierarchical model for the flow of supply chain information. Furthermore, this paper outlines a method for recording information blocks that encompass both internal and external data sources within the supply chain, detailing the structural composition and analysis of multisource data. Additionally, a method for recording multisource data information blocks is presented. The implementation of a blockchain-based supply chain system is anticipated to enhance the integration and reconstruction capabilities of the supply chain. By recording internal data and related external multisource data within the blockchain, the learnability of the supply chain is expected to improve. The connection of internal and external information blocks within the supply chain system represents a further integration and reconstruction of the information resources in the

blockchain framework. The information storage and access control mechanisms of the blockchain-based supply chain serve as a security assurance system for information sharing within the supply chain environment. Through the methodologies proposed in this study, a business architecture centred on blockchain-based supply chain information sharing can be established.

Keyword- Blockchain Technology, Hierarchical, Integration.

THE IMPACT OF EMERGING TECHNOLOGIES IN THE AVIATION MANUFACTURING INDUSTRY: A CASE STUDY OF THE GRADUAL-CHANGE FACTORS IN SHAANXI, PR CHINA

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Abstract

As China's economy continues to strengthen, the government has prioritized the swift advancement of the civil aviation sector and aims to bridge the technological divide with leading aircraft manufacturers. The integration of suitable technologies within the aviation industry is essential for fulfilling the government's objectives of job creation and revenue enhancement through civil aviation. Nevertheless, the inherent uncertainty and evolving nature of emerging technologies present considerable challenges when implemented in aviation manufacturing. This article employs system dynamics principles and methodologies, informed by expert interviews that identify gradual-change factors of emerging technologies, to develop conceptual models illustrating their progressive evolution in the aviation manufacturing sector. Historical data from Shaanxi province were utilized to simulate and analyze the gradual advancement of these technologies. The analysis of the simulation outcomes indicated that the rapid emergence of competitive technologies during the growth phase hampers the gradual evolution of emerging technologies. Additionally, enhancements in enterprise innovation

capabilities, expansion of market demand, and optimization of technology significantly facilitate the development and application of emerging technologies. The findings further suggest that competitive products and technologies play a crucial role in the gradual progression of emerging technologies. Ultimately, the results emphasize the importance of optimizing the performance and functionality of emerging technologies during their initial development phase rather than waiting until they reach the market application stage.

Keyword- Shaanxi, Optimization, Progression

MIND THE GAP: BRIDGING THE DIVIDE BETWEEN THEORY AND PRACTICE WITH VIRTUAL REALITY IN STEM EDUCATION

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Abstract

Virtual Reality (VR) is reshaping STEM education by providing immersive, interactive experiences that allow students to better understand complex scientific concepts. This paper examines the effectiveness of VR-based simulations in enhancing students' understanding of challenging topics in physics, chemistry, and mathematics. A case study was conducted with two groups of high school students: one utilizing traditional teaching methods (control group) and the other using VR simulations (experimental group). Both groups were assessed through pre- and post-tests to evaluate conceptual understanding and problem-solving skills, while surveys gauged student engagement and motivation. The results revealed that the experimental group showed significant improvements in their comprehension, problem-solving ability, and engagement compared to the control group. The study concludes that VR is a powerful tool for enriching STEM education through interactive learning. Further research is needed to explore the long-term impact and scalability of VR in various educational settings.

Keyword-VR, STEM, Problem Solving.

DEEP LEARNING FOR AUTOMATED SIGN LANGUAGE RECOGNITION AND TRANSLATION USING CONVOLUTIONAL NEURAL NETWORKS

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Abstract

This study explores the use of deep learning techniques, specifically Convolutional Neural Networks (CNNs), for automated sign language recognition and translation. Addressing the communication gap between the hearing-impaired and the broader population, this research focuses on creating an efficient and accurate system capable of interpreting sign language gestures into text or speech. A robust CNN model is designed to process and classify hand gestures from input video frames or images, leveraging the unique features of each gesture for effective translation. The dataset used includes 50,000 labeled images across multiple sign languages, with preprocessing techniques such as resizing, normalization, and data augmentation employed to enhance model performance. The Adam optimizer is utilized to improve convergence speed and stability during training. Through extensive validation, the system demonstrates high accuracy in recognizing and translating sign language, highlighting its potential for real-world applications, such as in education, customer service, and accessibility tools. This study contributes to the advancement of assistive technologies and promotes inclusive communication.

AI-POWERED SMART AGRICULTURE ADVISORY SYSTEM

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Abstract

Agriculture plays an important role in ensuring food security worldwide, but crop disease is a serious issue, leading to yield reduction and economic losses to the farmers. The conventional practices of disease detection through visual observation are typically time-consuming, subjective, and not feasible for large-scale monitoring. The need for high-performance and automatic decisions led to the creation of **MASE-Net** (Multi-Stage Attention & Severity Estimation Network), a deep-learning AI model that is applied specifically in crop disease classification and infection severity estimation. According to severity estimation, the proposed model allows for real-time intervention by allowing farmers to implement treatment based on actual disease progress rather than human visual estimates. MASE-Net has a CNN-Transformer hybrid architecture and light feature extraction from MobileNetV3 and spatial object relation detection through **MobileViT.** Supervised training is carried out on over 40,000 annotated images of diversified crops, including rice, wheat, tomato, corn, and strawberry. Lacking ground truth severity labels, unsupervised severity estimation leverages an attention mechanism to map disease-affected regions and estimate severity levels. One of the largest challenges in

deploying AI in agriculture is providing real-time inference on devices that are resource-constrained, particularly in rural areas where internet connectivity is poor. To address this, MASE-Net is optimized for on-device deployment using **ONNX Runtime**, providing smooth computation on edge and mobile systems. This enables farmers and agricultural stakeholders to receive real-time disease diagnosis and severity analysis without high-end computational equipment. Large-scale testing on a major agricultural dataset confirms that MASE-Net attains 97.3% classification accuracy, outperforming conventional CNN-based models. With severity estimation, the model achieves a Mean Absolute Error of 4.6% and an R^2 value of 0.92, validating its suitability for measuring disease severity. Findings confirm MASE-Net as a highly accurate and dependable solution for actual agriculture. The system can be expected to reduce crop loss, optimize pesticide use, and reduce overall agricultural production loss, making AI-based disease management affordable to farmers globally. MASE-Net, with edge AI, attention, and deep learning, is part of an efficient and sustainable agriculture system that empowers farmers with data-driven insights to improve crop health care.

Keywords-Crop Disease Detection, Severity Estimation, Deep Learning, MobileNet, Attention Mechanism, Precision Agriculture.

EFFECTIVE PREDICTION OF LUNG CANCER UTILIZING ENHANCED RESTRICTED BOLTZMANN MACHINE TECHNIQUE

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Abstract

Lung cancer is a leading cause of death worldwide, with smoking being the main risk factor. Smoking exposes the lungs to harmful substances, increasing the chances of developing cancer. The longer someone smokes, the higher the risk. While smoking is the biggest cause, other factors like family history, environmental pollution, and certain work conditions can also contribute. Quitting smoking lowers the risk of lung cancer, and early detection can improve survival rates. Efforts to reduce smoking are important in preventing lung cancer and improving public health. Feature Extraction in data mining is the process of transforming raw data into a set of meaningful features (or variables) that can be used as input to datamining algorithms. Feature extraction significantly impacts the performance and accuracy of a machine learning model's predictions. The main aim of this proposed work is improving the prediction of lung cancer by utilizing Enhanced Restricted Boltzmann Machine algorithm. A Restricted Boltzmann Machine (RBM) is a type of generative stochastic neural network that is commonly used for unsupervised feature extraction.

This methodology significantly improved the prediction percentage and reduced the model complexity.

Keywords-Lung cancer prediction, Data mining, Smoking, Feature Extraction, Data Preprocessing, Restricted Boltzmann Machine.

THE ROLE OF CLOUD COMPUTING AND VIRTUALIZATION IN MODERN IT INFRASTRUCTURE

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Abstract

The advent of cloud computing and virtualization has revolutionized the way organizations approach computing and resource allocation. Cloud computing provides on-demand access to a shared pool of computing resources, while virtualization enables the creation of multiple virtual machines on a single physical host. This paper provides a comprehensive review and analysis of cloud computing and virtualization, highlighting their benefits, challenges, and future directions. We explore the key characteristics, deployment models, and service models of cloud computing, as well as the different types of virtualizations, including server, desktop, and application virtualization. Our analysis reveals that the integration of cloud computing and virtualization can provide significant benefits, including improved resource utilization, increased flexibility, and enhanced scalability. However, we also identify several challenges and limitations, including security concerns, vendor lock-in, and the need for specialized skills. Finally, we discuss future directions for

cloud computing and virtualization, including the emergence of new technologies, such as containerization and edge computing.

Keywords-Cloud computing, virtualization, resource allocation, scalability, flexibility, security.

ECOCHIC –"THE TRENDY GUIDE TO SUSTAINABLE LIVING ON SOCIAL MEDIA"

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Abstract :

Organizations are increasingly using social media to enhance their visibility and relationships with their publics. These platforms enable disseminating information, participating, and actively engaging in online conversations with stakeholders. This chapter presents a critical review of organizations' dialogic communications via social networks, examining five key dimensions: active presence, interactive attitude, interactive resources, responsiveness, and conversation. The contribution examines each dimension's effect on the organization's dialogic communication with the publics. Hence, this contribution has resulted in important implications for corporate communication practitioners as well as for academia. Moreover, it opens future research avenues to academia.

Keywords : Dialogic communication, corporate communication, online conversations, social media, social networks, online visibility, online responsiveness.

INDUSTRIAL AND COMMERCIAL APPLICATIONS OF TECHNOLOGIES

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Abstract

Commercial and Industrial uses of technology efficiency, creativity and competitiveness have been fueled by technology in the commercial and industrial sectors in recent years. Automation, artificial intelligence (AI), and the Internet of Things (IoT) are the results of these applications in industries. These technologies have improved the manufacturing, logistics, and energy management, lowering cost and raising productivity. Predictive maintenance and precise engineering are made possible by advanced robotics, 3D printing, and smart sensors, which reduce downtime and improve safety. The commercial sector's use of this technology has changed customer service, retail, and finance. Contactless payments methods, block chain-based transactions, AI-driven marketing, and e-commerce platforms have all enhanced the customer experience. Furthermore, cloud computing and big data analytics support operational effectiveness and corporate insight .This study examines the major technical developments influencing the commercial and industrial sectors, stressing their advantages, difficulties and potential ramifications. The report emphasizes how innovation promotes global economic progress and sustainable growth.

Keywords: Artificial Intelligence, Internet of Things, Cloud Computing, Contactless payment.

THE ETHICAL DILEMMAS OF AI IN CYBERSECURITY: BALANCING PRIVACY AND PROTECTION

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Abstract

Now Artificial Intelligence is becoming an ever-increasing support tool for enhancing cybersecurity and ensuring data privacy. As cyber threats grow complex, traditional security methods often cannot keep pace with challenges emanating from advanced persistent threats (APTs), zero-day attacks, and other crime forms. AI, with its ability to digest and analyze large volumes of data, recognize facets, and adapt to current threats, has been integrated into numerous cybersecurity strategies. The paper seeks to assess how AI, in essence, strengthens cybersecurity defenses, enhances data privacy, and enables the early detection and recoiling from threats. It addresses the downsides of artificial intelligence use in the field of cybersecurity as data bias, ethical issues, and the mission for skilled workers. The study gives insights on how companies can utilize AI.

Keywords-component, formatting, style, styling, insert (key words).

CLOUD COMPUTING VIRTUALIZATION: IMPROVING SCALABILITY, SECURITY, AND EFFICACY

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Abstract

Cloud computing, which offers a variety of services through the internet, is a successful technology that has grown rapidly. Network services, database administration, software, among the many tools and applications it provides are data storage and other tools. And Web-enabled service can store and retrieve files for users via the cloud. Cloud computing can help to reduce IT costs. Depending on their needs, users can access services and exchange data. The ideal option for companies growing their infrastructure or applications is cloud computing. Virtualization and virtual environments are essential elements of cloud computing that facilitate data sharing, computation, and storage. For many years, the IT sector has employed virtualization, which is highly pertinent to the growth of cloud services. With the use of this technology, you can run several operating systems and apps that are totally separate from one another. It is frequently employed in storage area networks, which allow several clients or businesses to share resources simultaneously. In this paper, the role of cloud computing's virtualization technology is thoroughly described. Cloud computing includes both storage and computing services.

Keywords-Virtualization, Cloud computing, Infrastructure or Invocations.

THE ROLE OF FINTECH IN ENHANCING GREEN INVESTMENT: OPPORTUNITIES, CHALLENGES, AND DIGITAL FINANCIAL INCLUSION

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Abstract

As the world moves toward sustainable development, the integration of Financial Technology (FinTech) into green investment has emerged as a transformative force. FinTech plays a crucial role in mobilizing capital for environmentally responsible projects by providing accessible, transparent, and efficient financial solutions. Technologies such as blockchain, AI-driven investment platforms, and digital payment systems enhance investor confidence and facilitate seamless participation in sustainable finance. Moreover, FinTech-powered green bonds, carbon credit trading, and peer-to-peer lending for eco-friendly projects have created new avenues for responsible investing. Despite its potential, challenges such as regulatory uncertainty, greenwashing concerns, cybersecurity risks, and socio-economic barriers hinder the widespread adoption of FinTech in green finance. Understanding the key drivers and obstacles in this sector is essential to creating a financially inclusive and environmentally conscious investment landscape. This study explores the factors influencing the adoption of FinTech for green investment through a survey-based analysis,

assessing investor awareness, trust, and willingness to adopt digital financial solutions.

Keywords-FinTech, green investment, sustainable finance, digital finance, blockchain, AI in finance, digital payments.

AI-DRIVEN OPTIMIZATION IN RENEWABLE ENERGY INTEGRATION FOR SMART GRID SYSTEMS

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Abstract

This study investigates the transformative role of artificial intelligence (AI) in integrating renewable energy into smart grid systems. Addressing the inherent challenges of intermittency and scalability in renewable energy sources, the research leverages machine learning (ML) algorithms for energy generation forecasting, dynamic load balancing, and efficient energy distribution. Results demonstrate improved grid reliability, reduced energy wastage, and enhanced scalability, promising a sustainable energy future.

Keyword-AI,ML, Smart Grid System.

AN IN-DEPTH ANALYSIS OF DEVOPS TOOLS AND THEIR MECHANISMS

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Abstract

Software DevOps integrates software development and IT operations to enhance collaboration, streamline workflows, and accelerate software delivery through automation. This research provides a comprehensive analysis of various DevOps tools, their functionalities, and their impact on the Software Development Life Cycle (SDLC). The study examines the operational principles of DevOps, emphasizing automation, continuous integration (CI), continuous deployment (CD), and continuous monitoring, all of which are essential for modern software development. The research study employs a comparative evaluation method to assess prominent DevOps tools, identifying their advantages, limitations, and suitability for different development environments. The study highlights how automation-driven approaches improve deployment speed, reduce errors, and enhance system reliability. Additionally, the paper explores critical challenges such as security vulnerabilities, toolchain complexities, and skill gaps that organizations face when implementing DevOps. Findings indicate that DevOps adoption significantly improves software quality,

operational efficiency, and scalability while reducing time-to-market. The novelty of this research lies in its comprehensive assessment of DevOps toolchains and their optimization strategies for overcoming common implementation hurdles. Furthermore, the study presents future predictions, focusing on AI-driven automation, Infrastructure as Code (IaC), and serverless computing as emerging trends that will redefine DevOps practices. By addressing both the benefits and constraints of DevOps methodologies, this paper contributes valuable insights for organizations seeking to enhance software development efficiency through automation.

Keywords: DevOps, Software Development Life Cycle, Continuous Integration, Automation, Infrastructure as Code.

CREATIVITY AT RISK: THE NEGATIVE IMPACT OF USING AI CHATBOT ON STUDENT INNOVATION

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Abstract

Educational facilities introduced Artificial Intelligence tools for students allowing them instant access to knowledge blended with academic assistance features. Excessive AI implementation within educational settings leads students and educators to doubt the levels of creativity together with independent thinking abilities and problem-solving competencies. Students who use AI Tools to complete assignments are becoming lack of absorption. Due to this, the intellectual progress of education and learning consistently decreasing and leads the stake holders to accomplish their tasks with lack of originality. AI-based content production systems create higher possibilities for academic dishonest practices, that is being developed among students and professors through plagiarism. This study examines the impact of AI Chatbot on student creativity and offers ethical evaluations before providing operational standards for AI use in educational environments. Students can achieve critical cognitive learning development when AI functions as an assisting technology instead of acting as a replacement for critical thinking abilities.

Keyword-AI, Chatbot, Critical Thinking.

EMOTION SENSITIVE MOBILE APPLICATION USING MULTI-MODAL SENSOR DATA

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Abstract

Mobile application markets consistently showing rapid growth, due to the increasing enthusiasm of users. Achieving better user psychological health together with enhanced interactive experiences relies on applications that explore multiple sensor inputs. These applications acquire data about user's physical conditions along with their movements coupled with environmental readings. Improved accuracy in emotion detection depends on the serious development process that incorporates various sensor systems. This paper examines market trends of emotion-sensitive programs using application while analyzing both accuracy and data privacy alongside collection methods. The work analyzes emotional detection using multiple sensors along with technical aspects and ethical implications and societal effects of these applications.

Keyword-Mobile Application, Emotion Detection, sensors.

ANALYZING THE INFLUENCE OF SOCIAL MEDIA ALGORITHMS ON MENTAL HEALTH: RISKS AND IMPLICATIONS

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Abstract

Social media algorithms significantly shape user experiences by curating personalized content, but their psychological impact remains a critical area of study. This research analyzes the influence of four major social media algorithms such as Collaborative Filtering, Deep Neural Networks (DNNs), Reinforcement Learning-based Recommendation Systems, and Graph Neural Networks (GNNs) on mental health. The study aims to evaluate how these algorithms contribute to issues like anxiety, depression, addiction, and cognitive overload. The methodology involves data collection through sentiment analysis of user interactions, psychological surveys, and engagement metrics from diverse platforms. A comparative analysis of the four algorithms is conducted using five key performance metrics: engagement rate, content diversity, user well-being index, algorithmic bias, and psychological distress score. Experimental results highlight that while deep learning-based models enhance content personalization, they also intensify filter bubbles, leading to cognitive stress. Reinforcement learning algorithms, optimized for engagement, exhibit higher addiction potential, whereas GNN-based recommendations

demonstrate better content diversity but amplify echo chamber effects. The findings reveal that algorithmic design plays a crucial role in influencing mental health outcomes, necessitating the need for ethical AI frameworks in social media. The novelty of this study lies in its comparative analysis of multiple social media algorithms using psychological and computational performance metrics, providing a multidisciplinary perspective on the implications of algorithm-driven content exposure. The study underscores the urgency for AI-driven interventions to mitigate adverse mental health effects while preserving user engagement and personalization.

Keywords-Social Media Algorithms, Mental Health Impact, Deep Learning, Algorithmic Bias, Cognitive Overload.

INTRUSION DETECTION SYSTEMS: A REVIEW OF MACHINE LEARNING AND DEEP LEARNING ALGORITHMS

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Abstract

Networks have increasing influences on modern life, making cyber security an important field of research. Cyber security techniques mainly include anti-virus software, firewalls and intrusion detection systems (IDSs). These techniques protect networks from internal and external attacks. Among them, an IDS is a type of detection system that plays a key role in protecting cyber security by monitoring the states of software and hardware running in a network which efficiently detect the network attacks and abnormal network intrusion. Despite decades of development, existing IDSs still face challenges in improving the detection accuracy, reducing the false alarm rate (FAR) and detecting unknown attacks. To solve the above problems, many researchers have focused on developing IDSs that capitalize on Machine Learning (ML) methods. ML methods can automatically discover the essential differences between normal data and abnormal data in networks with high accuracy. In addition, ML methods have strong generalizability which are capable to detect unknown attacks. Since, privacy numbers have increased and also a lot of modern systems are penetrated, so developing information security technologies to

detect the new attack become an important requirement. ML techniques are not much effective enough to cope with the advanced attacks. So, Deep Learning (DL) techniques have been developed for automatic IDS and abnormal behaviour identification of networks. DL include an important IDS operation called learning by training to deduce new knowledge for decision-making which distinguishes DL from all other traditional programming techniques and makes it an expert system. This paper presents an inclusive analysis of IDS to detect the unknown attack package by using a ML and DL models. Initially, different IDS techniques designed by many researchers based on ML and DL models are studied in brief. Then, a comparative study is conducted to understand the drawbacks of those algorithms and suggest a new solution to improve IDS ability to reach high detection rate and low FAR in networks security.

Keywords-Intrusion Detection System, Abnormal Behaviour, Machine Learning Deep Learning, Unknown Attack.

EMERGING TECHNOLOGIES AND INNOVATIONS IN PRECISION AGRICULTURE: RECENT ADVANCES FOR MODERN FARMING

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Abstract

Precision farming, which maximizes crop production and sustainability by applying cutting-edge technologies and algorithms, has become a revolutionary approach to new-age farming. In order to develop more effective and data-driven agricultural methods, precision agriculture has recently advanced by using modern technologies like the Internet of Things (IoT), drones, satellites, and artificial intelligence (AI). The use of machine learning models to assess soil health and weather patterns, as well as deep learning algorithms for crop disease diagnosis, weed control, and yield prediction, are important developments. With the help of artificial intelligence (AI) and computer vision, autonomous farming equipment can make decisions in real time about things like planting, watering, and harvesting. Predictive maintenance techniques driven by AI also ensure the resilience and efficiency of machinery used in agriculture. Moreover, AI-driven predictive maintenance techniques guarantee the dependability and efficiency of agricultural gear. Crop health and environmental conditions can be precisely monitored through the use of sensor networks and cutting-edge imaging technology, including drones and satellite-based remote sensing. The study reviews innovative AI models and methods,

such as deep learning architectures like ViT, YOLOv8, MAE, GNNs, Federated Learning, FL, and SSL, for enhancing farming practices. Emerging techniques like hyperspectral imaging, UAV swarm intelligence, and AI-powered robotics enhance precision in plant health assessment that are shaping the future of precision agriculture, highlighting their impact on increasing productivity, reducing the use of resources, and promoting sustainable farming practices. These advancements not only address the growing demand for food but also aim to minimize the environmental footprint of agricultural operations.

Keywords-Deep learning, Artificial Intelligence, computer vision, vision transformer Precision Agriculture.

SMART IRRIGATION SYSTEM BASED ON ARDUINO FOR AUTOMATION IN WATER MANAGEMENT EFFICIENCY

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Abstract

This paper presents a Smart Irrigation System based on Arduino Uno, designed to automate water management in agricultural fields. The system utilizes soil moisture and temperature sensors, a servo motor, an ultrasonic sensor, and a buzzer to control the operation of a water pump via the Arduino Uno microcontroller. By ensuring appropriate soil moisture levels and considering temperature changes, the system enhances agricultural productivity while preventing overwatering and underwatering. This environmentally friendly and cost-effective solution promotes healthier plant growth and efficient water usage, making it a practical approach to precision agriculture.

Keywords- Smart Irrigation System, DHT Sensor, Ultrasonic Sensor, Buzzer, Servo Motor, Crop Protection, Efficient Water Management, modern farming practices.

FROM SEISMIC INTENSITY TO PUBLIC PERCEPTION: EVALUATING CDI-BASED EARTHQUAKE ALERT CLASSIFICATION USING MACHINE LEARNING

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Abstract

Seismic early warning systems utilize a variety of intensity measures to determine the impact of earthquakes and initiate alerts. The Modified Mercalli Intensity (MMI) scale gives a systematic measure of ground shaking from the observed effects, while the Community Determined Intensity (CDI) integrates personal experience of earthquake effects. This paper examines the application of CDI as a primary input for the categorization of earthquake alerts through machine learning algorithms. Employing publicly available earthquake intensity reports and empirical data, we explore whether CDI-based models can improve early warning systems, especially in areas with sparse instrumental data. Our workflow includes data preprocessing, feature extraction, and training machine learning models to categorize earthquake alerts as a function of CDI values. The study also compares the reliability and predictive accuracy of CDI-based predictions with traditional MMI-based approaches. The results of this study shows that it can help improve earthquake alert systems by incorporating data indicative of public perception, thereby making warnings adaptive and accessible to greater populations.

Keywords-CDI , MMI, Earthquake, Machine Learning.