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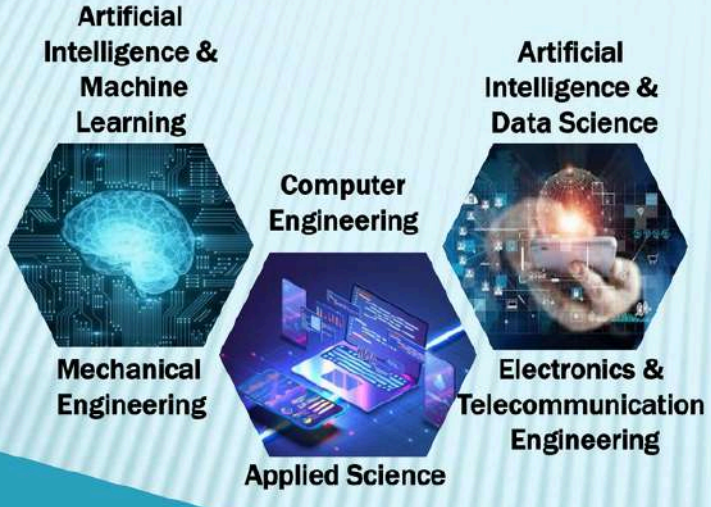

International Conference on Multidisciplinary Emerging Trends in Engineering and Technology (ICMETET – 2024)

Publisher

Journal Press India

Editors

Dr. Pankaj Kumar Srivastava
Dr. M. P. Yadav
Dr. Vilas. R. Joshi

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ISBM College of Engineering, Pune

International Conference

On

Multidisciplinary Emerging Trends in Engineering and Technology (ICMETET 2024)

25th - 27th April 2024

Editors

Dr. Pankaj Kumar Srivastava
Dr. M. P. Yadav
Dr. Vilas. R. Joshi

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Contents

About the Conference

India's economy has experienced significant growth, driven by comprehensive economic reforms, the development of new infrastructure, and initiatives aimed at boosting manufacturing, such as the 'Make in India' program. These efforts have established India as a major player in the global technology landscape, marked by rapid technological advancements and a flourishing startup ecosystem.

The International Conference on Multidisciplinary Emerging Trends in Engineering and Technology (ICMETET 2024) serves as a critical platform for professionals and researchers to exchange insights, discuss technological breakthroughs, and encourage interdisciplinary collaboration in the continuously evolving fields of Engineering and Technology. The conference will offer a wide spectrum of presentations, workshops, and networking opportunities, facilitating an in-depth exploration of the latest trends shaping the future of these disciplines. Attendees will have the chance to engage with topics such as artificial intelligence, sustainable technologies, and cybersecurity, among others. Esteemed experts and thought leaders will share their perspectives, enhancing our understanding of the current innovations and challenges in this multidisciplinary environment.

Further, ICMETET 2024 is set to be an interdisciplinary event that seeks to explore diverse techniques for developing global leadership, particularly in key priority sectors. The conference will focus on emerging trends across various disciplines within engineering and technology, covering topics that range from Computer Engineering to mechanical engineering, and from Artificial Intelligence, Cyber Security, Block-Chain, Cloud Computing to Biomedical Engineering, Healthcare Technologies, and Energy and Environmental Engineering. This extensive discussion will equip attendees with a comprehensive view of the cutting-edge technologies and methodologies at the forefront of their fields.

By fostering an environment of knowledge sharing and collaboration, ICMETET 2024 aims to cultivate a community that not only addresses current technological challenges but also anticipates future opportunities in engineering and technology. This pivotal event is not merely a venue for exchanging knowledge; it is a catalyst for forging connections that drive significant advancements and reinforce global innovation and leadership in these critical areas.

Objectives of the Conference

- Facilitating Interdisciplinary Collaboration: The conference aims to serve as a dynamic platform for experts from diverse fields within engineering and technology. It encourages collaborative efforts, sharing of insights, and exploration of interdisciplinary approaches to tackle complex challenges.

About the Conference

- Knowledge Dissemination: ICMETET 2024 acts as a pivotal forum for disseminating the latest research findings, developments, and innovations in various emerging areas of engineering and technology. This objective supports the conference's mission to stay at the forefront of technological advancement.
- Networking Opportunities: The event provides numerous opportunities for attendees to network, forge new collaborations, and foster partnerships with peers and leading experts across different sectors of engineering and technology.
- Addressing Contemporary Challenges: With a focus on emerging trends, the conference aims to address contemporary technological and engineering challenges. It seeks to explore innovative solutions that can drive progress and advancements across various domains.
- Promoting Academic and Industrial Exchange: ICMETET 2024 is committed to enhancing the dialogue and exchange between academia and industry. This initiative enables the effective transfer of knowledge and technologies, addressing real-world problems and promoting innovation within the engineering and technology sectors.

About the Institution

ISBM College of Engineering, Pune, accredited by NAAC and a constituent of the People's Empowerment Group, was founded in 2010. Over the last 12 years, ISBM COE has experienced rapid growth and established a strong alumni network that spans across the country and around the globe. At ISBM College of Engineering Pune, we uphold a high standard of education and continuously strive to create a learning environment that fosters great careers. We offer a Bachelor of Engineering (BE) program that is approved by AICTE, Delhi, DTE, Mumbai, the Maharashtra State Government, and affiliated with Savitribai Phule Pune University.

We believe in reshaping the attitudes of our students, providing them opportunities to explore and rediscover themselves. As part of our holistic approach, an ISBM College of Engineering Pune student learns to work under demanding schedules and perform in the most inspiring ways. Our mission is to mold future leaders who are not only technically proficient but also ethical and innovative, ready to contribute positively to the global community.

About the Partner

Journal Press India (JPI) is a publishing house devoted to the publication of high-quality research journals in the areas of commerce, management, finance, accounting, Indian economy, international business and taxation. All the journals are peer-reviewed and invite innovative research from experts, addressing topical issues in their respective areas.

JPI also offer online solutions for 'Journal publications' and 'Conference management'.

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For details, please visit *www.journalpressindia.com/conference.php*

Message from President

I am delighted to extend my warmest greetings as ISBM College of Engineering, Pune, prepares to host the International Conference on Multidisciplinary Emerging Trends in Engineering and Technology (ICMETET 2024), in collaboration with Journal Press India (JPI). Since the founding of our institution, ISBM College of Engineering has been committed to excellence in all fields of engineering, while pushing forward our mission of professional and technical development.

We are dedicated to creating an environment at ISBM that encourages research and innovation, making this conference a crucial step towards inspiring our students and researchers to achieve their best. ICMETET 2024 will provide a vibrant platform for our undergraduates, postgraduates, research scholars, and faculty to showcase their innovative ideas and latest advancements in engineering and technology.

I wish to express my deep appreciation to our organizing committee, department heads and all staff members whose exceptional dedication has been pivotal in organizing this conference. As we look forward to the start of the event, I extend my best wishes to all participants for a successful and enlightening conference. I am confident that ICMETET 2024 will inspire many more to engage in research, thereby enhancing their personal achievements and contributing significantly to the advancement of education.

Dr. Pramod Kumar
President
Peoples Empowerment Group
Nande, Pune

About the Editors

Dr. Pankaj Kumar Srivastava

Dr. P.K. Srivastava is a distinguished academician and administrator, currently serving as the Principal at our esteemed institution. He holds a Ph.D. in Electronics and Telecommunication from S.G.G.S. Nanded and M.Tech. in Microwave Engineering from the College of Engineering Pune (COEP). Dr. Srivastava has held several significant positions including Head of Department at various Engineering Colleges, Executive Member, and IEEE Branch Counselor.

In his current role, he also serves as the Research Coordinator at many colleges and is an approved Ph.D. guide at Pune University. He is a member of the Research Committee at Savitribai Phule Pune University, under the Avishkar initiative constituted by the Vice Chancellor. Dr. Srivastava is a prolific author, having published numerous research papers in both national and international conferences and journals. He has also successfully filed many patents, contributing significantly to the field of engineering and technology.

Dr. M. P. Yadav

Dr. M. P. Yadav is serving as the Dean of ISBM College of Engineering, Pune, bringing with him 31 years of extensive experience in various academic and administrative capacities in different colleges and universities. He received his Ph.D. in Physics, specializing in Electron Spin Resonance (E.S.R.), from the University of Allahabad, and completed an M.Sc. in Physics with a focus on Digital and Communication Electronics. Through his career, he had served at various positions in several engineering colleges and universities. Demonstrating his adaptability and proficiency in academic administration. As an accomplished scholar, he had published many research articles in both national and international journals and is the author of intellectual books. His leadership and academic contributions continue to significantly enhance the educational standards and research initiatives at ISBM College of Engineering.

Dr. Vilas R. Joshi

Professor (Dr.) Vilas R. Joshi is currently leading the Department of Computer Engineering at ISBM College of Engineering, Pune. With a robust blend of industry and academic experience, he has spent three years in the industry has over sixteen years of teaching experience. He had made significant contributions to his field, having published five patents and four books. Additionally, he has authored eight research papers, four of which are indexed in Scopus.

About the Editors

Dr. Joshi earned his Doctor of Philosophy in Electronics and Communication Engineering from OPJS University, Churu, Rajasthan, where his research focused on addressing issues in 5G network systems, culminating in his thesis titled ‘Handling Problems in 5G Network System’ and was awarded in August 2021. He holds a Master of Engineering in Electronics from the Government College of Engineering, Aurangabad, where he graduated with First Class Distinction in August 2010. He also received his Bachelor of Engineering in Electronics and Telecommunication from the same institution, graduating with First Class Distinction in July 2004.

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Preface

Welcome to the proceedings of the International Conference on Multidisciplinary Emerging Trends in Engineering and Technology (ICMETET 2024), hosted by ISBM College of Engineering, Pune. This conference marks a significant milestone in our continual quest to foster an academic and professional dialogue among researchers, educators, and practitioners from around the globe in the fields of Engineering and Technology.

The theme of this year's conference, "Exploring Sustainable Innovation by Bridging Technology and Society for a Better Tomorrow" aims to spotlight the innovative advancements and challenges that define our era. It brings together a diverse mix of voices and perspectives, reflecting the multidisciplinary nature of modern engineering challenges and the collaborative efforts required to address them.

The papers included in these proceedings have been selected through a rigorous peer review process, upheld by the standards of the Journal Press India (JPI) and the collaborative efforts of our esteemed partners. Each contribution was evaluated on the basis of its relevance to the conference theme, the novelty of its research, and its potential impact on the field. The works presented here offer insights into cutting-edge research and emerging trends across various disciplines such as artificial intelligence, cybersecurity, sustainable technologies, and more, highlighting the collaborative efforts of academia and industry.

We extend our gratitude to all contributors whose relentless pursuit of knowledge and innovation makes this conference possible. Our thanks also go to the conference committee, the reviewers, and all our academic and industrial partners for their invaluable support.

It is our sincere hope that the ICMETET 2024 proceedings will serve as a valuable resource for researchers and practitioners alike and will inspire continued advancement in the diverse fields of engineering and technology. We also hope that the discussions, ideas, and networking fostered during this conference will lead to future collaborations and innovations.

Thank you for being a part of this pivotal event, and may your participation be both productive and enlightening.

Dr. Vilas R. Joshi
Convenor ICMETET 2024

Acknowledgments

On behalf of ISBM College of Engineering, Pune, I extend our deepest gratitude to everyone who contributed to the success of the International Conference on Multidisciplinary Emerging Trends in Engineering and Technology (ICMETET 2024). This event could not have been possible without the collaborative efforts and dedication of various individuals and organizations.

I particularly thankful to our partners, Journal Press India (JPI), for their support in the publication and management of the conference proceedings. Their expertise and commitment to maintaining high academic standards have greatly enriched the quality of our discussions and publications.

I owe a special thank to all the members of the Conference Organizing Committee, Conference Steering Committee, and Internal/External Reviewers who worked tirelessly behind the scenes to ensure the smooth running of the event. Their meticulous planning and execution facilitated a conducive environment for learning and networking.

Heartfelt thanks to our keynote speakers, Session chairs, and Presenters, whose insights and expertise were pivotal in driving the academic rigor and relevance of the conference. We are also grateful to all the participants and attendees whose enthusiasm and engagement were vital to the vibrant discourse throughout the conference. Additionally, we thank the staff and volunteers whose dedication made managing the logistics of such a complex event seem effortless.

Lastly, we extend our thanks to the College management, administrative, all teaching, non-teaching and, supporting staff at ISBM College of Engineering, Pune, for their indispensable roles in facilitating and hosting this prestigious gathering.

Dr. Vilas R. Joshi
Convenor ICMETET 2024

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Advanced Materials and Manufacturing

Implementation of Solid Wire by Weaving Mechanism

Rahul Nagmode and Bhairavnath Jadhav***

ABSTRACT

In welding process, weaving motion plays an important role regarding quality of weld. Weaving is nothing but zigzag type of motion for manual weaving; worker should be skilled & highly experienced. During survey it is observed the L-seam type automatic welding machine lacking the weaving motion of torch. The machine uses flux type of welding wire which has theoretical efficiency is 80% & also produce slag which leads to the process of back gouging. Paper aims to provide a weaving motion mechanism to automatic welding machine so that it will be compatible to use solid metal wire type welding which is comparatively cheap with 100% theoretical efficiency & without producing slag so complete or partial elimination of back gouging process. According to estimate it will save Rs.38 per kg of weld metal & hence results in the cost saving with improved quality of weld also need of skilled worker is eliminated.

Keywords: Welding; Weaving Mechanism; Gmaw; Fcaw.

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Design, Analysis and Fabrication of Go-Kart Vehicle

Shubham Yadav, Pushpak Patil**, Omkar Kumbhar***, Sopan Vyavhare****, Mahesh Yadgire***** and Vaibhav Edake*******

ABSTRACT

A Go-kart is a small four wheeled vehicle. Go-kart, by definition, has no suspension and no differential. They are usually raced on scaled down tracks, but are sometimes driven as entertainment or as a hobby by non-professionals. Our goal is to design and fabricate an eco-friendly go-kart that offers exceptional performance, driver comfort, and safety. The primary focus is on creating a lightweight kart that delivers impressive performance. Adherence to the rulebook of Edgeline Championship is mandatory and significantly influences our objectives. The go-kart, which is propelled by a rear- wheel internal combustion engine without suspension or differential, has been designed in accordance with standard principles. All critical factors and design parameters have been taken into account, resulting in a thoroughly failure-analysed and ergonomically optimized go-kart. Comprehensive calculations have been conducted for each component, followed by 3D modelling and simulation using professional software tools. The analysis was carried out with different iterations and finally the optimum design of each part of the Go kart was done so as to obtain the optimum result.

Keywords: Go-kart; Design of Frame; Analysis; Transmission; Innovation.

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Biomedical Engineering and Healthcare Technologies

Advancements in AI-Based Histopathology: Revolutionizing Disease Detection

Soma Garani and Subhrodipto Basu Choudhury***

ABSTRACT

Histology plays a crucial role in disease detection by examining tissues at a microscopic level. While traditionally reliant on pathologists, advancements in computerized image processing have enabled automated analysis of histopathological images, enhancing speed and accuracy. Histology, combined with advanced technologies, significantly contributes to disease detection and diagnosis. The intestinal mucosal immune compartment plays a crucial role in the gastrointestinal immune response of fish. Whereas histopathological image providing valuable insights into disease detection and immune function. Artificial Intelligence (AI) applications for histology images have shown significant promise in revolutionizing pathology workflows. AI frameworks utilizing machine learning algorithms like CNN, ANN, have been developed to classify different tissue damage gradation. AI in histopathology holds immense potential for enhancing diagnostic accuracy, reducing workload, and improving patient outcome. By utilizing AI methodologies, we can swiftly comprehend disease severity, thereby expediting the therapeutic process by delving into the intricate details of pathology. Hence this paper is presented.

Keywords: Disease; Histopathology; Image; Analysis.

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Enhanced Polyp Detection using AI-powered Technology

Pankaj Jangid and Shreya Soddi***

ABSTRACT

Globally, colorectal cancer (CRC) is one of the leading causes of death; effective treatment depends on early identification. Although colonoscopy is still the gold standard for CRC screening, human error, technical error and weariness can affect the polyp detection rate. In order to improve polyp detection during colonoscopy operations, a novel strategy leveraging Artificial intelligence powered technology is proposed in this research. Our technology performs real-time endoscopic image analysis using deep learning techniques, computer vision, Convolutional neural network, and ML enabling precise polyp identification and characterization with high sensitivity and specificity. We exhibit greater performance compared with previous approaches, notably lowering miss rates and increasing diagnosis accuracy through an extensive dataset and thorough validation process. The use of this technology could transform colorectal cancer (CRC) screening by facilitating early diagnosis and, eventually, and for saving lives. This study constitutes a noteworthy progression in the domain of health care.

Keywords: Colorectal Cancer; Colonoscopy; Artificial Intelligence; Deep Learning; Polyp Detection.

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Parkinson's Sickness Expectation Framework Utilizing

Rushikesh Thorat and Mamta Borse***

ABSTRACT

The wide application of patient engagement and its associated benefits has increased across government, academic and pharmaceutical research. However, neither an identified standard practice for the process of engagement, nor utilization of common metrics to assess associated outcomes, exists. Parkinson's Foundation developed a patient engagement framework and metrics to assess engagement within the academic research and drug development sectors. This approach was developed over the course of several years through assessing the literature, acquiring feedback from researchers and people with Parkinson's disease and adapting practices to be relevant and generalizable across patient engagement projects. This framework includes the: 1) creation of a scope of work, 2) establishment of guiding principles, 3) selection and training of participants, 4) co-determination of project metrics, 5) execution of the project and 6) dissemination of project findings. Parkinson's Foundation has also worked with academic, government and pharmaceutical stakeholders to identify metrics that assess both the quality of patient engagement and outcomes associated with patient engagement on projects. By improving patient engagement project methodologies and metrics, global clinical trials can have access to evidence-based patient engagement practices to more efficiently capture the needs of, and potentially benefit, the patient community.

Keywords: Parkinson's Disease; Python; Disease Detection using ML; Kaggle; SVM Algorithm.

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Reforming Breast Cancer Prediction through Advanced Machine Learning Model

Mohammad Khaja Shaik, Ujwal Singh**, Ankur Anand***, Komal Borchate**** and Prajwal Sutar******

ABSTRACT

One of the most common and fatal types of cancer that impact women globally is still breast cancer. For breast cancer to be effectively treated and patient outcomes to be enhanced, early and precise identification is essential. We provide a breast cancer classification framework in this work that makes use of logistic regression, a popular statistical technique for situations involving binary classification. The aim of this project is to create a model that can use attributes taken from diagnostic imaging data to differentiate between benign and malignant breast cancers. First, we gather and preprocess a large dataset of imaging features and clinical characteristics taken from samples of breast tissue. To learn more about the distribution and properties of the data, exploratory data analysis is carried out. To extract pertinent features and get the dataset ready for model training, feature engineering techniques are used. The processed data is used to train logistic regression models, and hyper parameter adjustment is done to maximize model performance.

Keywords: Comparative Analyses; Improved Accuracy; Early Detection; Precision Medicine; Shaping Future Research Directions.

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Brain Tumor Early Stage Prediction

Vishwam Pareek and Omkar Nikam***

ABSTRACT

This study looks at how Convolutional Neural Network (CNN) algorithms can be used to predict brain tumors in their early stages. Early diagnosis of brain tumors is critical for prompt treatment and better patient outcomes. Using CNN's capacity to successfully extract characteristics from medical imaging data, we offer a novel strategy to improving the accuracy and efficiency of brain tumor prediction in its early stages. Our approach entails preprocessing medical pictures to improve clarity and minimize noise, followed by the development of a CNN model for categorization. Furthermore we hope to provide guidance through medically recognized doctors by connecting patients to them for second opinions. To train and test the CNN model, we use a collection of medical imaging images from patients with diagnosed brain tumors at different stages. We test our CNN-based prediction model's performance using rigorous experimentation and cross-validation procedures. Accuracy is a key assessment measure in this project.

Keywords: Brain Tumor Prediction; Machine Learning; Healthcare; Early Recognition.

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Computational Engineering and Simulation

Unity and Oculus Powered AI Companion

Swami Dewalkar, Ishita Asthana** and Saniya Pacha****

ABSTRACT

In order to give consumers an engaging and interactive virtual personal assistant experience, this project describes the construction of an AI companion using Unity and Oculus technology. A dynamic environment for generating genuine interactions with the AI companion is provided by the combination of Oculus' cutting-edge VR technology and Unity's powerful game engine. By utilising natural language processing, the AI companion can interpret user requests, carry on human-like conversations, and deliver pertinent information and support. A greater sense of connection and companionship is fostered when users interact with the AI companion in an engaging and natural way thanks to the combination of Oculus' immersive hardware and Unity's adaptable programming environment. The scope of our virtual assistant is broad and offers a wide range of functionalities, including voice commands for tasks like setting alarms and controlling smart devices. It provides a friendly, free environment for users, allowing them to perform tasks without physical interaction, especially in hands-occupied situations. The response can be spoken back to the user. The assistant refines responses to individual user preferences through iterative interactions, and can be deployed on multiple platforms, including Android, IOS, VR, and AR, using animations and user presentations for effective engagement.

Keywords: Unity; Oculus; Artificial Intelligence; NLP.

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Book Recommendation with E-library

Archana Prajapati, Trupti Gajghat**, Srivalli Mangalampalli***, Vaishnavi Deshmukh**** and Sonali Parab******

ABSTRACT

This research paper introduces a comprehensive book recommendation system that integrates collaborative filtering algorithms with a user-friendly web application interface. The system aims to enhance user engagement and satisfaction by providing personalized book recommendations based on user preferences and book metadata. Users can register and log in to the web application, where they can upload books, receive tailored recommendations, and manage their book library. The recommendation engine employs advanced collaborative filtering techniques to analyze user interactions and similarities among books, ensuring accurate and relevant suggestions. Additionally, the system utilizes machine learning models to continuously refine recommendations based on user feedback and behavior. Through extensive experimentation and evaluation, the system demonstrates its effectiveness in improving user satisfaction and promoting book discovery. The research contributes to the field of personalized recommendation systems by offering a practical implementation that combines algorithmic sophistication with user-centric design principles. The findings underscore the importance of personalized recommendations in enhancing user experiences and driving engagement in digital book platforms.

Keywords: Web Development; Python; Machine Learning; Database.

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Air Canvas

Pradyumn Rudrawar, Naresh Choudhary**, Jay Gumate*** and Vilas Joshi*****

ABSTRACT

The "Air Canvas" is an innovative digital drawing application that harnesses the power of computer vision and hand tracking technology to enable a captivating user experience. By utilizing a standard webcam or video capture device, this application can detect and analyze the user's hand movements in real-time, allowing them to control a digital canvas and create drawings through natural gestures. One of the standout features of the "Air Canvas" is its dynamic crayon selection system. Users can easily switch between a variety of virtual "crayon" colors by simply moving their fingers across the bottom of the screen, providing a seamless and intuitive way to experiment with different artistic palettes. To further enhance the interactive experience, the application incorporates audio feedback, playing corresponding sound effects for actions such as drawing, erasing, and crayon selection. Additionally, the system periodically displays randomly generated nouns, which can serve as inspiration for the user's artistic endeavors. The modular design of the "Air Canvas" ensures easy integration and scalability, paving the way for future enhancements and feature additions. This application showcases the remarkable potential of blending computer vision, image processing, and interactive user interfaces to create a truly unique and engaging platform for digital drawing.

Keywords: Computer Vision; Hand Tracking; Dynamic Crayon Selection; Streamlit; OpenCV.

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Encryption and Decryption using 128 Bit AES Algorithm

Rhugved Hegde, Satya Prakash Singh** and Yash Pulate****

ABSTRACT

In an era marked by the ubiquitous presence of digital video content, ensuring the security and privacy of such data has become a pressing concern. This project endeavors to address this challenge through the development of a robust video encryption and decryption system leveraging the Advanced Encryption Standard (AES) algorithm with a 128 bit cipher key. The primary objective of the project is to explore the theoretical foundations, practical implementation, and real world applications of AES based video security solutions. The abstracted encryption process involves converting plaintext video data into ciphertext using the AES algorithm, rendering it indecipherable to unauthorized users. Conversely, decryption reverses this process, allowing authorized parties to access and view the original video content. The adoption of AES, a widely recognized and trusted encryption standard, ensures the confidentiality, integrity, and authenticity of video data, safeguarding it against unauthorized access, interception, and tampering. The project aims to contribute to the advancement of video security technologies by conducting a comprehensive literature review, theoretical analysis, and practical experimentation.

Keywords: Encryption; Decryption; AES Algorithm; 128 bit Key; Data Security.

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Revealing the Future of Stock Markets: Sophisticated Genetic Algorithm-driven Horizontal Partition Decision Tree for Predicting Closing Values

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ABSTRACT

In the continuously evolving realm of financial markets, achieving precise forecasts of stock prices remains an ongoing challenge. This study introduces an innovative strategy, titled "Unveiling the Future of Stock Markets," which employs a sophisticated Genetic Algorithm-Based Horizontal Partition Decision Tree (GA-HPDT) to accurately predict closing values. This novel methodology harnesses the potential of genetic algorithms for feature selection and decision tree modelling, thereby elevating the accuracy of forecasts. Rigorous experimentation conducted on historical stock market data illustrates the efficacy of our approach, highlighting significant enhancements in prediction accuracy over conventional techniques. By discerning concealed patterns and trends within stock market data, our model provides invaluable insights for stakeholders such as investors, traders, and financial analysts. The stock market has long intrigued investors, analysts, and researchers owing to its inherent intricacy and potential for financial gain. Precisely forecasting stock prices has remained beyond the reach of conventional statistical and analytical techniques.

Keywords: Share Market Projection; Genetic Programming; Closing Price Estimation; Capital Markets.

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Mitigation of Seismic Vulnerability of the Silt Floor using Composite Column

Rajashekhar Talikoti and Abhishek Chaudhari***

ABSTRACT

The increase in population from the past few years has made the major concern for vehicle parking and hence generally we used first storey of the building as a parking. RC frames buildings with a soft storey known as weak storey is a storey in a building that has substantially less resistance or stiffness than the stories above or below. Such buildings are most common in India specially in residential flat schemes. In this project the assessment of seismic response of the building using steel-concrete composite columns at the level of ground storey is assessed by linear and nonlinear analysis. The response spectra method is used for linear analysis and time history method is used for nonlinear analysis. The response of composite columns are compared with the stiffened column through three different analytical models. The infill walls are modeled using equivalent strut approach. The analysis is performed using finite element software SAP. The result obtained indicates that the soft Storey column may be replaced by a composite column which have higher strength. It is strongly recommended to provide steel column composite column at the level of soft Storey to increase the performance of silt floor.

Keywords: Composite Column; Soft Storey; Nonlinear Analysis; Time History Analysis.

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Design and Implementation of Restful Automated Document Verification System

Sahil Sahay, Vilas Joshi** and Divya Londhe****

ABSTRACT

Our groundbreaking solution integrates state-of-the-art technology to transform document verification processes for Indian government initiatives. By seamlessly combining advanced digital signature verification with cutting-edge Optical Character Recognition (OCR) technology, we aim to revolutionize the speed and security of verification procedures. In addition to digital signature verification and OCR, our solution employs robust encryption techniques to ensure the utmost confidentiality and data integrity throughout the verification process. This multi-layered security approach not only safeguards against unauthorized access but also mitigates the risks associated with data breaches and cyber threats. Furthermore, our system adheres to RESTful principles, enabling smooth communication and interoperability with existing government systems. This facilitates seamless integration with various government databases and applications, facilitating efficient data exchange and collaboration across different departments and agencies. Ultimately, our innovative approach aims to optimize the efficiency of government schemes, fostering transparency, building citizen trust, and ensuring that eligible individuals receive timely access to essential services and benefits. Through the integration of digital signature verification, OCR technology, and advanced security measures, our solution represents a significant leap forward in modernizing and enhancing government operations in India.

Keywords: Rest API; OCR Technology; Digital Signature; Transparency; Integration.

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Resonant Java: Orchestrating Reactive Programming for Responsive Applications

Shiv Shankar and Vilas Joshi***

ABSTRACT

In the realm of software development, achieving responsiveness in applications is paramount. This research delves into the integration of reactive programming paradigms within Java ecosystems, aiming to harmonize its implementation for the creation of highly responsive applications. The purpose of this study is to address the challenge of incorporating reactive principles seamlessly into Java based projects, thereby enhancing their responsiveness and user experience. Methodologically, this research employs a comprehensive review of existing literature, coupled with practical experimentation and analysis, utilizing reactive libraries such as RxJava and Project Reactor alongside traditional Java concurrency mechanisms. Data collection involves benchmarking performance metrics and evaluating the scalability and efficiency of reactive Java implementations. Results reveal a significant improvement in application responsiveness through the adoption of reactive programming patterns within Java environments. The synthesis of reactive and imperative paradigms demonstrates a tangible enhancement in handling asynchronous events and managing concurrent tasks, leading to reduced latency and increased throughput. Conclusions drawn from this study underscore the viability and effectiveness of integrating reactive programming concepts into Java development practices, with implications extending to various domains such as web development, cloud computing, and distributed systems, where responsiveness is critical for user satisfaction and system performance.

Keywords: Reactive Programming; Java; Responsiveness; RxJava; Project Reactor.

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Energy and Environmental Engineering

The Future of Hydrogen Energy: A Study

Poonam Yadav and Bhagyashree Patil***

ABSTRACT

The Future of Hydrogen provides an extensive and independent survey of hydrogen that lays out where things stand now; the ways in which hydrogen can help to achieve a clean, secure and affordable energy future; and how we can go about realizing its potential. Future installed capacity proportions of renewable energy can be used as a carrier to optimize power system operation and stabilize renewable energy fluctuations, supporting the nation's transition to a clean, low-carbon energy source. The cost of producing green hydrogen will continue to decline due to the ongoing, extensive development of renewable energy, and this could lead to the trend of green hydrogen development in the future. This paper provides an overview of the research of hydrogen energy and the primary renewable energy methods for producing hydrogen, such as wind, photovoltaic, and biomass power. The use of hydrogen to balance wind power generation is also detailed. The different techniques for production and storage of hydrogen are discussed. The various applications of hydrogen in transportation and load leveling are presented.

Keywords: Renewable; Energy; Hydrogen; Application.

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Improved Energy Management for a Microgrid Including Electric Vehicle Charging Stations

*Neha Singh**

ABSTRACT

The quantity of electric vehicles (EVs) out and about is supposed to keep on expanding during the following a long time because of different factors, for example, the quick advancement in EV innovation and diminishing battery costs. The drawn out battery charging process, which is one of the principal issues that influences the expanded EV entrance, makes the quick charging units more alluring and proficient choice for the charging stations. In this review, a control methodology for a DC microgrid including electric vehicle quick charging station (EVFCS) and disseminated age units is introduced to look at the effects of EVFCS on the matrix as well as their expected commitments to the framework activity on account of thinking about the vehicle-to-network (V2G) innovation. It is particularly planned to relieve the voltage hang and swell issues by involving the EV battery as a DC wellspring of a circulation static compensator (D-STATCOM) gadget. Recreation concentrates in MATLAB Simulink/SimPower frameworks demonstrate the way that extensive upgrades can be accomplished according to the point of view of conveyance framework activity like superior voltage quality and according to the viewpoint of end clients like diminished charging terms.

Keywords: Electric Vehicles; Fast Charging Stations; Microgrid; Distributed Generation; V2G.

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Design and Development of Heat Recovery Model for Hotel Industries

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ABSTRACT

Primary goal of our project is to repurpose the heat emitted by a kitchen gas burner to heat water for dishwashing and other hospitality needs, such as in hotels. We plan to achieve this by installing copper tubes beneath the gas burner, through which water will flow. The heat from the burner will transfer to the water via these tubes, resulting in hot water output. This hot water will then pass through Phase Change Material (PCM), causing the PCM's temperature to rise and eventually change its phase. The water, now heated, will be collected in a tank and regulated by a flow control valve before being pumped out through a nozzle for dish cleaning. During periods of burner inactivity, the PCM will transfer its stored heat back to the water, ensuring a consistent output temperature for effective dishwashing. We intend to create a 3D model using CATIA software, conduct analysis with ANSYS, and perform experimental testing to validate our concept before drawing conclusions.

Keywords: Dishwasher; Waste Heat Recovery; Hotel Industry; Burner; Gas.

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Automatic Plant Watering System with Plant Health Prediction using CNN

Saurabh Chavan, Yogesh Singh** and Pooja Kolhe****

ABSTRACT

The automatic plant watering system integrated with plant health prediction using convolutional neural networks represents a significant advancement in precision agriculture. Soil moisture, a critical factor affecting plant growth, is influenced by precipitation, temperature, and soil characteristics. Inadequate moisture can lead to yield loss and plant mortality, while excessive moisture can cause root diseases and water wastage. Leveraging supervised machine learning algorithms, we predict whether a plant is "healthy" or "not healthy" based on the plant leaf images data. Our project aims to automate the process of farming by analyzing and determining optimal watering times. The system displays real-time data on a display, enabling informed choices for water release from the pump. By conserving water and minimizing human intervention, this smart system contributes to sustainable agriculture and improved crop health. The goal is to optimize water usage, prevent overwatering, and enhance crop yield. In summary, our project combines hardware (sensors, water pump) and software (CNNs) to create an intelligent, efficient, and environmentally conscious solution for modern farming.

Keywords: Automatic Plant Watering; Plant Health Prediction; Neural Networks; Soil Moisture.

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Energy Resource and Environmental Engineering

*Suman Mishra**

ABSTRACT

Environmental Engineering is a truly interdisciplinary science that combines biology, ecology, geology, geography, mathematics, chemistry, agronomy, medicine, and economics. Its primary goal is to use environmental understanding and technological advancements to serve humanity by reducing the production of environmental hazards and mitigating the effects of existing hazards in soil, water, and air. Key activities of environmental engineers include managing water supply, wastewater, solid waste, controlling air and noise pollution, assessing environmental impact, addressing climate change, and promoting environmental sustainability. Ultimately, their mission is to prevent or minimize undesirable impacts of human activities on the environment, ensuring a better tomorrow for all. Energy and the environment are intricately linked, influencing each other in profound ways. India plays a critical role in determining the success of the Sustainable Development Goals (SDGs) globally. Let's explore the impact of sustainable development on India: 2030 Agenda for Sustainable Development: The 17 SDGs and 169 targets form a transformative agenda known as the 2030

Keywords: Ecosystem; Pollution; Energy Resources; Environment.

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Solar Tracking System

Omkar Kadam and Shreyas Kau***

ABSTRACT

"Sun oriented Global positioning framework" is a power creating strategy from daylight. This strategy for power age is straightforward and is taken from regular asset. This needs just most extreme daylight to create power. This paper helps for power age by setting the gear to consequently get greatest daylight. This framework is following for most extreme power of light. At the point when there is decline in power of light, this framework naturally adjusts its course to get greatest force of light. The "Sun-Oriented Global Positioning Framework" is an innovative approach to harness solar energy efficiently. It utilizes sunlight as a renewable resource and optimizes power generation by automatically adjusting its position to capture the maximum sunlight possible. This system not only contributes to a sustainable power age but also adapts to varying light conditions, ensuring consistent energy production. By efficiently utilizing sunlight, solar tracking systems contribute to a more sustainable and effective use of solar power.

Keywords: Solar Tracking System; Stepper Motor; Decade Counter; LDR.

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Information and Communication Technology

Design and Implementation of Restful Chat PWA

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ABSTRACT

The RESTful Chat Progressive Web Application (PWA) design and implementation represents a pioneering approach to state-of-the-art chat applications for platforms and devices. Using the principles of Representative State Transfer (REST), this work ensures efficient communication and communication systems. RESTful architecture enables seamless data exchange between client and server, increasing responsiveness and scalability. This new PWA provides users with a dynamic and intuitive chat experience. Its dynamic system easily adapts to a variety of screen sizes and device types, ensuring consistent performance during sessions. The processing capabilities of PWAs allow users to install chat applications directly on their devices, allowing for offline access and faster load times. Moreover, RESTful design simplifies the development and maintenance process. By organizing objects into well-defined endpoints, it simplifies communication systems and increases interoperability with other systems. This not only encourages productivity but also enables seamless integration with existing software ecosystems. Specifically, the combination of RESTful architecture and Progressive Web App technology in this chat app marks a major leap forward in modernizing communication systems setting a new standard for efficient and functional chat apps much in today's digital landscape that prioritizes user experience, accessibility and accomplishment.

Keywords: MERN Stack; Rest API; PWA; Socket.io; JWT.

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MechEng Navigator: A Singular Mobile Hub for Exploring Mechanical Labs and Instruments in Higher Education

Chandrakant Khemkar, Tushar Edake** and Prashik Patil****

ABSTRACT

This research paper works into the development of Mech-Eng Navigator or application, a cutting-edge mobile application crafted by the People's Empowerment Group at ISB&M College of Engineering, Pune. The application serves as a comprehensive hub, offering intricate insights into the Mechanical Engineering department's labs and instruments. This paper expounds on the project's comprehensive scope, hardware or software requisites, advantages, disadvantages, future prospects, and the anticipated impact on the landscape of mechanical Engineering education. The Mechanical Engineering Navigator application emerges as a transformative tool poised to significantly impact mechanical Engineering education. It holds promise in elevating accessibility, efficiency, and safety. However, effective mitigation strategies must be employed to address challenges, ensuring the completeness, accuracy, usability, and functionality vital for widespread acceptance and success. The project's scope is extensive, encapsulating technical, functional, user-centric, business-oriented, and data-centric aspects. It elucidates technical requirements, functional features, target user demographics, potential business models, and data management considerations.

Keywords: Laboratory; Instruments; Mechanical; Data Management.

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Robotics and Automation

Arduino Based Obstacle Avoiding Robot - With Crash Detection & GPS System

Saloni Bhimellu, Shreta Das**, Savani Bhimellu***, Sakshi Raut****, Parjanya Kandala***** and Yogita Patil*******

ABSTRACT

In our robotics endeavor, we're not merely engineering a machine; we're cultivating a companion on wheels. This special vehicle, propelled by robotics, is imbued with advanced sensors meticulously crafted for obstacle detection and ensuring smooth navigation through various terrains. The meticulous orchestration of these sensors, guided by an intelligent microcontroller, guarantees precision in every movement, instilling confidence in its operation. Moreover, the integration of a cutting-edge GPS module elevates its navigational prowess, enabling accurate plotting of routes and enhancing overall exploration efficiency. Should an unexpected collision loom, our vigilant alert system springs into action, swiftly dispatching an SMS to facilitate prompt response and mitigation of potential damages or risks. Fueled by a blend of pioneering technology and creative ingenuity, our robotic companion not only promises seamless exploration but also prioritizes safety at every turn. With each expedition embarked upon, we edge closer to the realization of our overarching vision: a realm where secure and adventurous exploration intertwines harmoniously, pushing the boundaries of possibility while safeguarding against potential hazards.

Keywords: Arduino Nano; NEO-6M GPS Module; Obstacle Avoiding; Crash Detection; Sim 800L.

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Humanoid Robot

Onkar Wable; Samina Patel** and Rukyabano Sayyad****

ABSTRACT

For many years, humanoid robots have been the subject of study and development because of their ability to carry out duties in settings intended for people. In this abstract, we demonstrate a humanoid robot that can welcome people and move on its own. The humanoid robot can observe and comprehend its surroundings thanks to its sophisticated sensors and potent computing unit. It resembles a person in appearance and communicates with others using natural language and facial expressions. The robot's welcome system is designed to recognize people and strike up a conversation. To start a conversation, it can make an introduction and a few straightforward inquiries. The humanoid robot is capable of greeting people and walking on its own. It boasts an advanced locomotion mechanism that allows for smooth and effective movement. Using onboard sensors with a machine learning system that forecasts the robot's trajectory and modifies its mobility as necessary, the robot's motion is controlled.

Keywords: Robot; AI; Motors; Controller.

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CropGuard: IoT based Data Monitoring System for Agriculture

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ABSTRACT

CropGuard is an innovative Internet of Things (IoT) based system designed to monitor and optimize agricultural crop growth. It leverages cutting-edge sensors and wireless technology to collect real-time data on soil nutrient levels, specifically nitrogen, phosphorus, and potassium (NPK). At the heart of CropGuard lies an NPK sensor that continuously measures these critical nutrients in the soil. This data is transmitted wirelessly to an ESP module, which acts as the central processing unit. The ESP module analyzes the incoming data and determines if any nutrient deficiencies exist. If a deficiency is detected, CropGuard automatically triggers a water pump to release a nutrient-enriched solution tailored to the specific needs of the crops. This targeted fertilization approach ensures plants receive exactly the right nutrients they require, maximizing growth potential while minimizing waste. The system operates autonomously, reducing the need for manual monitoring and intervention. Farmers can remotely access data and control settings through a user-friendly mobile application, enabling data-driven decision-making and precision agriculture practices. By optimizing soil nutrient levels and facilitating precise fertilizer application, CropGuard enhances crop yields, improves resource efficiency, and promotes sustainable farming practices. This intelligent agricultural solution harnesses the power of IoT to revolutionize crop management and food production.

Keywords: IoT (Internet of Things); Precision Agriculture; NPK Sensor; Automated Fertilization; Data Monitoring.

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Human Emulated Robotic Hand

Rutu Ghatge, Irene Thomas**, Shrimant Madbhavi*** and Vyshakh Nambiar*****

ABSTRACT

The integration of advanced technologies in robotics has propelled the development of innovative solutions aimed at enhancing human-machine interaction and efficiency in various domains. The system comprises of the flex sensors, incorporated into the glove, detect and translate human hand gestures into electrical signals, enabling real-time interaction with the robotic hand. Through meticulous calibration and programming, servo motors replicate the movements detected by the flex sensors, allowing the robotic hand to emulate human-like dexterity and flexibility. The Arduino Uno board serves as the central control unit, facilitating seamless communication between the sensors, motors, and external devices. Furthermore, this project leverages the Microsoft Excel Data Streamer feature to visualize the data acquired from the flex sensors in real-time. By streaming sensor data directly into Excel, users can monitor and analyze hand movements, fostering a deeper understanding of the system's functionality and performance. Additionally, the project extends its utility by integrating a gaming application into the system, exemplified by a virtual rendition of the classic game, Rock-Paper-Scissors. From assisting individuals with physical disabilities to enhancing efficiency in manufacturing and healthcare sectors, the versatility and adaptability of this technology position it as a crucial asset in addressing contemporary challenges.

Keywords: Arduino Uno; Data Visualization; Flex Sensors; Human-emulated Robotic Hand; Microsoft Excel Data Streamer.

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Revolutionizing Automation: The Ingenious Color Sorting Robotic Arm

Shiv Sahay Yadav and Sanjay Kumar***

ABSTRACT

Robotics system is being used by packaging industries for product sorting and high sorting accuracy has so far been observed. Adoption of robot that can be used by agro processing industries for separation of impurities from food grains (like rice and beans) will go a long way in assuring high sorting accuracy, consumption safety, production efficiency and low cost of production. This study presents the design and development of a robotic arm equipped with a TCS color sensor for efficient object sorting using Arduino and servo motors. This study aims to enhance automation and streamline the sorting process based on the color attributes of objects. The robotic arm is controlled by Arduino, which processes input from the TCS3200 color sensor to identify and categorize objects based on their colors. Servo motors are employed to achieve precise and controlled movement of the robotic arm, ensuring accurate sorting. This innovative solution holds promise for applications in various industries, such as manufacturing and logistics, where rapid and reliable object sorting is essential for optimizing operational efficiency. The study focuses on to create an efficient and cost-effective solution for automated color sorting tasks in various industries, such as agriculture, manufacturing, and recycling.

Keywords: Robotic Arm; Arduino UNO; TCS3200 Color Sensor; Servo Motor.

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GSM based Fuel Theft Detector using Microcontroller

Avishkar Disale and Yash Jadhav***

ABSTRACT

In this paper we've got centered on growing an enhancement of the car alarm protection machine via SMS. The machine will manipulate a cellular cellphone to ship SMS. Even though the SMS can be dispatched the usage of the functions available in the cell, the goal of this experiment is to prompt the SMS sending by the cell phone using outside program connected bodily to the cell smartphone. Antitheft security device utilizes an embedded device designed with GSM to screen and protect a vehicle. In attempt of theft the system sends textual content message to the auto owner and on the identical time starts off evolved up an alarm from the buzzer set up inside the gadget. The protection of motors gas is extraordinarily essential for public so this task got here to our notice due to the alarming rate at which cars gas are being stolen in our country and with this layout our vehicle also can be monitored regardless of in which it's miles parked, furnished there may be a GSM network insurance. Our version makes use of only a few digital additives and looks very small and compact and may be hooked up on motors easily.

Keywords: GSM Technology; AT89S52 Microcontroller; LCD Display; IR Sensor; GSM Module.

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Design of Animatronic Arm Robot for Multipurpose Application

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ABSTRACT

A robotic arm is a particular kind of mechanical arm that can be programmed and performs tasks comparable to those of a human arm. It can be a standalone robot or a component of a more sophisticated robot. Such a manipulator has joints that allow for either translational (linear) displacement or rotational motion, similar to an articulated robot. A kinematic chain can be thought of as being formed by the manipulator's linkages. The end effector, which is similar to the human hand, is the culmination of the manipulator's kinematic chain. They are often motor-driven and frequently used for heavy and/or highly repetitive tasks that must be completed quickly and consistently over long periods of time. In present work we had worked dedicatedly on the physical aspects for making numerous corrections towards its movement dynamics to ensure that it is extremely accurate when engaged. Flexible (FLEX) sensors put on any wearable glove are used to control a robotic hand that repeats finger movements. It is possible to utilize a variety of sensors to track finger movement. Animatronic robot designed can demonstrates that the designed sensor that measures the angle of the fingers provides great accuracy despite being inexpensive.

Keywords: Animatronic Hand; Flex Sensor; Wearable Gloves; Robot Manipulators.

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Smart Cities and Infrastructure Development

Study of Application of AI in Small Scale Industry

Subhrodipto Basu Cjhoudhury and Asawari Bhalerao***

ABSTRACT

This paper makes a study on application of AI in small scale industry like textile industry etc. These processes are studied in this research: a) Quality of production b) Hiring process Nowadays, AI plays a crucial role in material management as required in the production of any organization. It is widely assumed that human labour has faced challenge with the intervention of emerging AI technology in the current era. This paper shows how human beings are gradually getting up-skilled by AI technology especially in prescriptive analytic domain. The paper also studied the following as listed below: a) Different AI technique used in small scale industry b) Comparison of AI technique for works in the organisation Analytic software like R, Python is used to analyse the data as extracted through primary research. Various questionnaires had been prepared to extract primary data from the general mass. AI has helped to simplify the process in the organisation.

Keywords: AI; Prescriptive Analytic; Quality; Production.

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IoT-based Smart Video Surveillance System with Edge-cloud Framework

*Prashant Badgujar**

ABSTRACT

Today, video surveillance system (VSS) around us is the need of time. The main purpose of such a video surveillance system is to prevent crime in advance by detecting abnormal events. The video surveillance systems can be widely used in smart cities, smart buildings, prevention of crime, automation, industry 4.0, and many more places. Conventional video surveillance systems are costly, slow, resource and energy-inefficient, having high bandwidth requirements, etc. The cloud-based video surveillance systems offer several advantages like flexibility, scalability, cost efficiency, remote accessibility, reduced maintenance, centralized management, enhanced security, reduced risk of data loss, real-time alerting, and many more. The scope of video surveillance system in the country like India having large population is increasing day by day. The reasons for this is huge market of country, population, start-ups, increasing crimes, etc. This paper focuses on implementing a smart video surveillance system having multiple cameras and which is based on the edge-cloud framework. It also identifies a motioneye OS as an efficient tool for video surveillance.

Keywords: IoVT; Video Surveillance System; Motioneye OS; Raspberry pi; Edge-cloud Framework.

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Sustainable Development and Green Technologies

Automatic Irrigation System (Soil Moisture)

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ABSTRACT

Here is a simple project more useful in watering plants automatically without any human interference. We may call it as Automatic plant irrigation system. We know that people do not pour the water on to the plants in their gardens when they go to vacation or often forget to water plants. As a result, there is a chance to get the plants damaged. The project is designed to develop an automatic irrigation system which switches the pump motor ON/OFF on sensing the moisture content of the soil. In the field of agriculture, use of proper method of irrigation is important. The advantage of using this method is to reduce human intervention and still ensure proper irrigation. As a result, there is a chance to get the plants damaged. A control is defined as an on-off switch when its function is to open or close an electrical circuit in a stable manner. This project is an excellent solution for such kind of problems.

Keywords: Irrigation; Moisture; Soil; Watering Plants.

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Advances in Sun-wind Oriented Hybrid Power for Future Development of Renewable Energy Sector in India

*Geetanjali Ligade**

ABSTRACT

Sun based power projects are based on a constant ground while wind power projects require dissipated land. This results in raising transmission costs and land-related complexities. The Sun-wind oriented hybrid (SWH) projects are most suitable to resolve these issues and speed up establishment. SWH power ventures will make a distinct region with adequate framework. The broad shore of India is invested with high wind stream speed and abundant sun based power assets, establishing an ideal climate for SWH activities to succeed while at the same time further developing network soundness and dependability. SWH plants ensure higher transmission proficiency and cost-viability than their independent partners. In this paper, state-wise SWH potential, the central members in the SWH project, the Public SWH, and the State SWH strategy and alterations were discussed. Actual advancement of SWH and business subtleties is also covered. An investigation to assess practicality of the SWH plant and essential plan system for conveying SWH power offices in India is performed. Each step of this cycle is covered in the study. Potential difficulties associated with SWH advancements are analyzed, and arrangements and alleviations for difficulties are proposed.

Keywords: SWH; Power Ventures; Framework; Transmission Proficiency; Cost Viability.

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Balancing Efficiency and Sustainability in Supply Chain Operations: An ANN-TOPSIS Framework

*Sanjay Kumar**

ABSTRACT

In the contemporary landscape of supply chain management, achieving a harmonious equilibrium between operational efficiency and sustainability has emerged as a critical imperative. This study presents significant advancements in supply chain optimization through the integration of Artificial Neural Network (ANN) and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), termed ANN-TOPSIS. Leveraging the capabilities of ANN, the framework offers a robust mechanism for analysing multifaceted supply chain data, capturing intricate relationships and nonlinear dynamics. Concurrently, TOPSIS facilitates the evaluation of alternative solutions based on diverse criteria encompassing economic, environmental, and social dimensions. Practical implications reveal actionable insights for industry practitioners, emphasizing enhanced decision-making accuracy, cost savings, environmental impact reduction, and improved responsiveness. Through a systematic comparative analysis, the framework identifies optimal strategies that concurrently optimize efficiency and sustainability objectives. By providing decision-makers with actionable insights, this integrated approach contributes to advancing sustainable practices within supply chain operations. This study underscores the ANN-TOPSIS framework's potential to address evolving supply chain challenges and contribute to sustainable business practices in a dynamic global landscape.

Keywords: ANN; TOPSIS; Sustainable; Supply Chain Management.

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Synthesis and Characterization of Cu(II) Complex with a Schiff Base Ligand

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ABSTRACT

A Schiff base ligand is such a compound having general formula R2C=NR/(R/ ≠ H). They can be considered as subclass of imines. The electrophilic carbon atoms of aldehydes and ketones can be targeted as nucleophilic attack by amine. The reaction completes with formation of C=N bond via replacement of C=O bond. The formation is generally driven to the completion by the removal of water. However Schiff bases are hydrolyzed back to aldehydes or ketones and amines in presence of aqueous acid or base. Such Schiff bases have wide applications in coordination chemistry. Multidentate ligands may be potentially chelating or potentially bridging. Some examples of first category are ethylenediamine, 1,3-diaminopropane, 1,4-diaminobutane, 2,2/-bipyridine, o-phenanthroline, salicylic acid, pyridine-2-aldehyde, benzaldehyde, while some examples of the second category are azide, thiocyanate, cyanate, tetracyano nickelate(II), hexacyanometalate (II/III). Reverse behavior is possible but that is more probable for the potentially chelating ligands; the potentially bridging ligands seldom behave as chelating ligands.

Keywords: Coordination Chemistry; Ligand; Synthesis; Crystal; Schiff Base.

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Transportation and Mobility Solutions

Connecting Cultures: A Solution for Immersive Travel in India

Atahrv Ukhalkar, Kaustubh Shinde**, Sarthak Barge***, Anjali Ukirde**** and Spurti Desai******

ABSTRACT

In the burgeoning landscape of global travel, accessing comprehensive services tailored to foreign traveller's needs remains a critical challenge. This paper introduces an innovative mobile application designed to streamline and enrich the travel experiences of international visitors exploring the diverse landscapes and vibrant cultures of India. The application serves as a one-stop solution, offering a seamless platform for booking transportation, accommodations, and accessing curated information about India's renowned landmarks, historical sites, and cultural attractions. With a user-friendly interface, travellers can effortlessly navigate through various options, including flights, trains, and local transportation services, facilitating smooth and efficient travel logistics. The application transcends conventional travel planning by integrating immersive cultural insights, providing users with a deeper understanding of India's rich heritage, traditions, and local customs. Through multimedia content, interactive guides, and virtual tours, travellers gain invaluable insights into the country's diverse cultural tapestry, enhancing their overall journey with meaningful encounters and authentic experiences. By offering tailored suggestions for sightseeing itineraries, culinary experiences, and cultural events, the application empowers travellers to create bespoke journeys aligned with their interests and aspirations. The application not only simplifies travel planning but also fosters deeper connections and meaningful engagement with India's rich tapestry of heritage and culture.

Keywords: UX; Local; Culture; Tourism; Personalization.

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Intelligent Traffic System

Sunil Lankennavar and Atharva Sukale***

ABSTRACT

The modern-day challenge of traffic management is multifaceted and deeply rooted in the exponential growth of population and automobile usage. As cities expand and urban areas become more densely populated, transportation systems face increasing strain. Traditional traffic control methods often rely on static timing patterns for traffic lights, which fail to adapt to fluctuations in actual traffic volume throughout the day. This leads to inefficient traffic flow, resulting in wasted time for commuters and exacerbating environmental issues such as air pollution and noise. To address these challenges, our proposed solution employs cutting-edge technology to dynamically regulate traffic flow based on real-time data. By utilizing cameras and sophisticated image processing algorithms, the system continuously monitors traffic density at intersections. This enables the system to intelligently adjust traffic light timings in response to changing conditions, optimizing traffic flow and reducing congestion. By harnessing the power of technology to accurately assess and address traffic conditions in real-time, we seek to improve the efficiency, safety, and sustainability of urban transportation networks.

Keywords: Traffic Management; Smart System; Real-time Monitoring; Traffic Control and Management.

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Solar Hybrid EV Prototype

Pratibha Gherade and Dinesh Kadam***

ABSTRACT

Half and half Sunlight based Electric Vehicles (HSEVs) address a promising road towards supportable transportation, coordinating the advantages of sun oriented power with electric drive. This theoretical presents the plan and improvement of a model HSEV pointed toward offering upgraded energy proficiency and decreased ecological effect. The model incorporates progressed photovoltaic (PV) boards onto the vehicle's surface to productively saddle sunlight based energy. These boards are decisively situated to amplify sun oriented openness while keeping up with stylish and streamlined contemplations. The reaped sun oriented energy is put away in high-limit batteries, which power an electric engine for drive. Key parts of the HSEV model incorporate complex power the executives frameworks to enhance energy stream between sunlight based chargers, batteries, and the electric engine. High level regenerative stopping mechanisms are carried out to recover motor energy during deceleration, further upgrading generally speaking productivity. Hybrid Solar Electric Vehicles (HSEVs) have emerged as a promising technology, combining the advantages of solar power and electric propulsion to offer efficient and environmentally-friendly mobility solutions.

Keywords: Hybrid Solar Electric Vehicle (HSEV); Sustainable Transportation; Photovoltaic (PV) Panels; Energy Efficiency.

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Transforming the Internet Decentralized Application

Prachi Sagar, Pranita Jagtap**, Purva Toraskar*** and Pranali Darkunde*****

ABSTRACT

Web3 decentralized applications (dApps) address a key change in the manner in which we communicate with and utilize the web. This theoretical investigates the idea of Web3 dApps, their basic innovations, and the groundbreaking potential they hold for the eventual fate of computerized association and information proprietorship. Web3 dApps are another age of uses based on decentralized blockchain networks, like Ethereum, Polkadot, and Solana. They are intended to place clients in charge of their information and advanced cooperations, offering straightforwardness, security, and trust through savvy contracts and decentralized stockpiling arrangements. This theoretical examines the center standards of Web3, including decentralization, blockchain joining, and client power. The unique digs into the imaginative highlights of Web3 dApps, for example, blockchain-based personality, self-executing shrewd agreements, and shared information trade. These highlights empower dApps to offer types of assistance without the requirement for conventional mediators, permitting clients to execute, impart, and cooperate in a trust-less and consent less climate. Web3 dApps can possibly upset different enterprises, from money and store network to virtual entertainment and gaming. DeFi dApps, for example, offer decentralized monetary administrations, while decentralized informal organizations mean to give clients command over their own information. NFT commercial centers have likewise acquired prominence

Keywords: Ethereum; Blockchain; Smart Contracts; Digital Assets; Distributed Order Book.

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Design and Fabrication of Chassis System for Electrical Hybrid Vehicle

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ABSTRACT

The urgent need to mitigate climate change and reduce dependence on fossil fuels has led to a surge in interest in renewable energy sources for transportation. This project focuses on the design and development of a solar-based electric car, aiming to harness solar energy as a primary power source to propel the vehicle. The integration of solar panels directly onto the car's surface offers a sustainable solution for extending the range and reducing the environmental impact of electric vehicles. The project begins with extensive research into existing solar car technologies and electric vehicle design principles. The solar-based electric car prototype represents a significant step towards sustainable transportation solutions, offering a compelling alternative to conventional gasoline-powered vehicles. By harnessing the abundant and renewable energy from the sun, the vehicle showcases the potential for clean and environmentally friendly mobility. The project outcomes not only demonstrate the feasibility of solar-powered electric vehicles but also provide valuable insights for future advancements in renewable energy integration and electric vehicle technology. This endeavor underscores the importance of interdisciplinary collaboration and innovation in addressing the challenges of climate change and transitioning towards a greener future.

Keywords: Renewable Energy; Solar based Electric Car; Chassis System; Energy Efficiency.

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Artificial Intelligence, Machine Learning and Deep Learning

Identification of Disease using Machine Learning Algorithm

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ABSTRACT

Medical imaging and deep learning methods have significantly improved the early detection of many diseases such as brain tumor with higher accuracy. Machine learning algorithms (MLA) especially neural-network based algorithms have shown huge success in medical field using image analysis for variety of tasks including the detection and classification of brain tumors. Usually, these models address one problem at a time which is considered as Artificial Weak Intelligence (AWI). There is the need to develop methods that can push the research towards strong or Artificial General AI where a single model can solve multiple tasks. This study analyzes unique machine learning algorithms used for healthcare applications to create adequate decision support. The proposed approach involves training ANNs on datasets containing relevant medical features such as patient demographics, clinical test results, and genetic markers. The trained ANNs are then utilized to classify whether a patient is afflicted with cancer, diabetes, or anaemia based on the input features. For cancer detection, ANNs are trained on datasets containing imaging data like X-rays, MRIs, or histopathology images along with patient history and genetic information. The network learns to identify patterns indicative of malignancy, aiding in early diagnosis and treatment planning.

Keywords: ANN; MLA; AWI; MRI.

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Crack Detection of Ancient Objects using Neural Network

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ABSTRACT

This paper explores the utilization of neural networks for crack detection in ancient artifacts and architectural structures, encompassing pottery, sculptures, and walls, crucial for cultural heritage preservation. Traditional methods often lack the precision necessary for comprehensive analysis, prompting the development of a robust system. Leveraging convolutional neural networks (CNNs), the project aims to automatically identify and classify cracks in various ancient objects and architectural elements. Data acquisition involves compiling a diverse dataset of high-resolution images depicting cracked artifacts and walls, enhancing model generalization through preprocessing techniques. Custom CNN architectures will be meticulously designed and optimized, with evaluations measuring accuracy, precision, recall, and F1-score across different artifact types and conditions. The research's outcome holds significant implications for cultural heritage conservation, providing a non-destructive crack detection tool essential for safeguarding our collective cultural legacy. By advancing our ability to preserve and understand ancient artifacts, this research contributes to the ongoing dialogue about the preservation and appreciation of our shared human history.

Keywords: Crack Detection; Neural Networks; Ancient Artifacts; Cultural Heritage Preservation; Convolutional Neural Networks (CNNs).

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KYC through Face Detection

Abhijeet Chavan, Anoop Nanekar** and KailashNath Tripathi****

ABSTRACT

In brand new digital panorama, the vital for secure and green KYC verification strategies is more critical than ever throughout diverse sectors like banking, finance, and e-commerce. Traditional strategies are frequently labor-extensive and at risk of inaccuracies. This assignment addresses these challenges via harnessing the improvements in computer-vision and device studying. By integrating facial popularity algorithms, the machine extracts and analyzes facial features from captured pictures along retrieving Aadhar card statistics. Sophisticated image processing strategies enable unique evaluation, accounting for various factors like lights, expressions, angles. This method guarantees no longer most effective faster verifications however additionally heightened accuracy and safety. The system's blessings include expedited processing, better precision, and fortified security features, accordingly massively enhancing patron onboarding stories. Automating verification approaches minimizes manual errors and reduces the potential for fraudulent activities, bolstering typical operational integrity. Implemented in Python using enterprise-popular libraries like OpenCV and TensorFlow, the device's overall performance might be meticulously evaluated the use of actual-international datasets to gauge accuracy, scalability, efficiency. In conclusion, this progressive KYC verification system represents a paradigm shift in virtual identity verification. By leveraging cutting-edge technologies, it promises to revolutionize verification processes, fostering safer and more green interactions between businesses and their customers.

Keywords: Know Your Customer; Realtime; Government Document; Immediately; Face Recognition.

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Semantic Analysis of Spam Reviews and Recommendation using Machine Learning

*Vilas Joshi**

ABSTRACT

Major Society of people using internet trust the contents of net. The liability that anyone can take off a survey give a brilliant chance to spammers to compose spam surveys about hotels and services for various interests. Recognizing these spammers and the spam content is a widely debated issue of research and in spite of the fact that an impressive number of studies have been done as of late towards this end, yet so far the procedures set forth still scarcely distinguish spam reviews, and none of them demonstrate the significance of each extracted feature type. In this application, use a novel structure, named NetSpam, which proposes spam features for demonstrating hotel review datasets as heterogeneous information networks to design spam review detection method into a classification issue in such networks. Utilizing the significance of spam features helps us to acquire better outcomes regarding different metrics on review datasets. The outcomes represent that NetSpam results with the previous methods and encompassed by four categories of features; involving review-behavioral, user-behavioral, review linguistic, user-linguistic, the first type of features performs better than the other categories.

Keywords: Social Media; Social Network; Spammer; Sentiment Analysis; Machine Learning.

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Driveguard: Robust Evaluator for Monitoring Drowsiness

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ABSTRACT

Drowsiness detection is crucial in ensuring safety, particularly in scenarios like driving where fatigue-related accidents pose significant risks. This project introduces a real-time drowsiness detection system using computer vision and deep learning techniques. The system employs facial recognition to detect the driver's face and analyzes the status of their eyes to determine drowsiness. The proposed system utilizes Haar cascades for facial and eye detection, enabling robust tracking of facial features. A Convolutional Neural Network (CNN) model is trained to classify eye states as open or closed. By continuously monitoring the eyes' status, the system calculates a drowsiness score based on the frequency of closed-eye instances. When the score exceeds a predefined threshold, indicating potential drowsiness, an alarm is triggered to alert the individual. Experimental results demonstrate the effectiveness of the proposed approach in accurately detecting drowsiness in real-time scenarios. The system provides a proactive mechanism to mitigate the risks associated with drowsy driving or any activity requiring sustained attention, thereby enhancing safety and preventing accidents. Additionally, the modular design of the system allows for easy integration into existing monitoring systems for broader application domains.

Keywords: Drowsiness Detection; Real-time Monitoring; Computer Vision; Convolutional Neural Network (CNN).

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Data Pre-processing Interface

Yash Aparajit, Saurabh Sanap**, Nikhil Kumar*** and Prajkta Puranik*****

ABSTRACT

In this paper, we present the Data Pre-processing Interface, a web-based tool for streamlining and automating data preprocessing, which is a critical component of machine learning, natural language processing (NLP), and data analytics. This interface provides a user-friendly platform for addressing numerous data management difficulties, such as cleaning and transformation, while also assuring cross-platform compatibility through the use of advanced web technologies. The system prioritizes scalability and usability in both frontend and backend development by employing a variety of algorithms and preprocessing techniques customized to different types of data. The project intends to improve productivity and accessibility by developing a simple web interface for data preprocessing. The overview digs into the project's objectives, outlining the data format, features, and interface functionality, which includes file upload, validation, sanitization, and tools to help users achieve their preprocessing goals. The study demonstrates considerable advances in data preparation, giving data scientists and analysts access to more exact and polished data. Finally, the findings highlight how the Data Preprocessing Interface improves the user experience.

Keywords: Machine Learning; Natural Language Processing; Data Pre-processing, User-friendly Platform.

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Quality Control for Soybean Seeds: A Deep Learning Perspective

Mrunali Bhor, Ibrahim Shaikh**, Kirti Randhe*** and Milind Ankleshwar*****

ABSTRACT

Quality control in the soybean industry is crucial for ensuring high-quality seeds and maximizing crop yields. Traditional methods for seed quality assessment often involve manual inspections, which can be time-consuming, subjective, and prone to human error. This research paper explores the application of deep learning techniques for automated quality control of soybean seeds. We investigate the performance of various state-of-the-art convolutional neural network (CNN) architectures, including ResNet, VGG16, and Inception, for classifying soybean seeds based on their physical characteristics. The proposed deep learning models leverage transfer learning and fine-tuning strategies to achieve accurate seed quality assessment. Additionally, we present a comprehensive mathematical analysis of the deep learning models, including their architectures, loss functions, and optimization algorithms. The experimental results demonstrate the superiority of the proposed deep learning approach over traditional methods, achieving higher accuracy and efficiency in seed quality assessment. Furthermore, the study highlights the potential of deep learning techniques to revolutionize the soybean industry by enabling real-time quality control and reducing the reliance on manual labor. The proposed system can be integrated into existing agricultural workflows, paving the way for improved seed quality, increased productivity, and enhanced profitability for soybean farmers.

Keywords: Soyabean Seed Defeats Identification; Deep Learning; Machine learning, Seed Classification.

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Air Handwriting using Machine Learning

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ABSTRACT

Air Handwriting represents a paradigm shift in lithography and illustration, moving away from traditional techniques and using expansive aerial canvases. This innovative approach uses gesture-underground input, using sophisticated stir shading technology to translate complex gestures into simple digital representations using traditional input interfaces such as keyboards or touchscreens avoiding Air signatures computing and interactivity in virtual reality scenarios offers an alternative to similar participatory digital domains Its intuitive nature opens up new ways in which humans and computers interact, enhancing accessibility and creative expression. This avant-garde approach has the potential to redefine the boundaries of technology and human-machine interaction, paving the way for a future of seamless integration of digital communication into everyday life. As a transformative tool, the wind signature holds the promise of transforming how we interact with technology, opening up new realms of creativity and communication. Its impact extends beyond mere simplicity, pointing to a future where the boundaries between the physical and digital worlds are blurred, and where expression knows no limits. This abstraction sheds light on the transformative power of wind signatures on the surface, and indicates a shift towards human- machine interaction

Keywords: Advanced Deep Learning Architectures; Robust Feature Extraction Techniques; Cutting-edge Classification Algorithms; Machine Learning.

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Generative Adversarial Networks for Image Generation

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ABSTRACT

Generative Adversarial Networks (GANs) have emerged as a powerful framework for generating realistic images across various domains, revolutionizing the field of artificial intelligence. This paper presents a comprehensive review of GANs for image generation, focusing on their architecture, training process, and applications. The fundamental concept of GANs revolves around the interplay between two neural networks: the generator and the discriminator. The generator aims to produce synthetic images that are indistinguishable from real ones, while the discriminator learns to differentiate between real and generated images. Through adversarial training, these networks iteratively improve their performance, resulting in the generation of high-quality images. Various architectures and techniques have been proposed to enhance the performance and stability of GANs, including Deep Convolutional GANs (DCGANs), Wasserstein GANs (WGANs), and Progressive Growing GANs (PGGANs). These advancements have led to remarkable achievements in image synthesis, style transfer, image super-resolution, and image-to-image translation. Despite their success, GANs still face challenges such as mode collapse, training instability, and evaluation metrics. Ongoing research efforts aim to address these limitations and further advance the capabilities of GANs for image generation. Overall, GANs represent a promising approach for synthesizing realistic images with diverse applications in computer vision, entertainment, and creative industries.

Keywords: GANs; Generator; Discriminator; Synthestic Image.

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Unveiling New Insight in Gastric Cancer Pinpointing: GasHisSDB Dataset and Hierarchical Segmentation for Enhanced Image Analysis

Sounak Ray, Yuvraj Kottalagi** and Amruta Aphale****

ABSTRACT

In today's world Gastric cancer stands as the fifth most common cancer globally, underscoring the crucial necessity for early detection to enhance survival rates. The scarcity of publicly available gastric histopathology image datasets poses challenges for evaluating computer-aided diagnostic techniques. GasHisSDB, a novel publicly available Gastric Histopathology Sub-size Image Database, comprising 245,196 tissue case images categorized into normal and abnormal classes. Various classifiers, including classical machine learning and Convolutional Neural Network (CNN) models such as VGG-16, ResNet and Inception_v3, are evaluated to assess their performance in image classification tasks. Different classifiers, encompassing classical ML and CNNs, exhibit notable accuracy discrepancies on GasHisSDB. Deep learning achieves a range of 67 to 98 percent accuracy across various algorithms. GasHisSDB facilitates weakly supervised learning in gastric cancer histopathology, driving advancements in automated diagnostics research. The fusion of GasHisSDB and hierarchical segmentation revolutionizes medical imaging analysis. This breakthrough enhances healthcare verdict, empowering professionals with advanced diagnostic tools, and signaling a transformative shift in medical imaging's evolution.

Keywords: Gastric Cancer; GasHisSDB' Convolution Nueral Network (CNN); Medical Imaging Analysis.

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Advancements in Deep Learning for Cyber Threat Detection and Mitigation

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ABSTRACT

As cyber threats evolve in complexity and frequency, the demand for robust detection and mitigation methods intensifies. Deep learning, particularly leveraging convolutional neural networks (CNNs) and recurrent neural networks (RNNs), has emerged as a formidable approach to address these challenges. This abstract explores the latest advancements in deep learning specifically tailored for cyber threat detection and mitigation. It delves into the innovative algorithms and methodologies developed to enhance the accuracy and efficiency of detection systems. Moreover, it examines the integration of deep learning techniques with traditional cybersecurity measures to create comprehensive defense mechanisms. Additionally, the abstract discusses the importance of large-scale datasets for training deep learning models, enabling them to effectively identify and respond to emerging cyber threats. Furthermore, it highlights the significance of explainable AI (XAI) techniques in enhancing the interpretability and trustworthiness of deep learning-based cyber threat detection systems. Through these advancements, deep learning continues to play a pivotal role in fortifying cyber defenses and safeguarding against evolving threats.

Keywords: Deep Learning; Cyber Threat Detection; Convolutional Neural Networks (CNNs); Recurrent Neural Networks (RNNs); Explainable AI (XAI).

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Exploration of the Deep Learning CNN with Optimised Mode of Object Detection for Advanced Driving Assistance

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ABSTRACT

In the past few years, there has been a rise in deep learning approaches with Convolutional Neural Networks (CNNs) at the forefront that have transformed many fields including Advanced Driving Assistance Systems (ADAS). The focus of this research is to examine whether CNNs can be used to enhance object detection for ADAS. This analysis takes on an inclusive approach by combining cutting-edge CNN architectures as well as advanced optimization techniques designed specifically for driving scenarios' object recognition tasks. By using huge, annotated datasets and fine-tuning strategies, the CNN models are trained so that they accurately locate and sort out different items necessary for safe driving like vehicles, pedestrians, cyclists, and road signs. Additionally, this study seeks to optimize the computational efficiency of the CNN model in order to enable its utility in real-time applications; a key requirement when deploying them on ADAS systems. Unlike conventional methods, the proposed approach reports notable enhancements in terms of object detection accuracy and computational efficiency through extensive experimentation and evaluation on benchmark datasets.

Keywords: Machine Learning; Convolutional Neural Networks (CNN); Foot and Mouth Disease (FMD); Lumpy Skin Disease (LSD).

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Elevating Patient Care: Precision Knee Osteoarthritis Diagnosis with CNN

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ABSTRACT

Knee osteoarthritis (OA) poses a formidable challenge to healthcare worldwide, necessitating precise diagnosis and severity classification for optimal patient care. In this study, we embark on a journey of medical innovation, employing Convolutional Neural Networks (CNNs) to redefine the landscape of knee osteoarthritis diagnosis. Our expedition begins with a diverse collection of knee X-ray images, each capturing a unique facet of the human experience with osteoarthritis. Through a pioneering CNN-driven approach, we unravel the complex tapestry of knee osteoarthritis and classify it into distinct severity levels. Delving deeper, our research dissects the architecture of the CNN, employing meticulous data preprocessing techniques to enhance performance. The results unearthed echo the promise of cutting-edge technology in reshaping musculoskeletal diagnostics, ushering in a new era of precision and efficiency in patient-centric healthcare. This contribution signifies a transformative shift in the realm of knee osteoarthritis diagnosis, marked by a steadfast commitment to advancing the boundaries of medical innovation.

Keywords: Knee Osteoarthritis; CNN; Severity Classification; X-ray Images and Musculoskeletal Diagnostics.

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Data Science and Artificial Intelligence Techniques for Predictive Analytics

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ABSTRACT

In today's data-driven era, the utilization of data science and artificial intelligence (AI) techniques has become paramount for predictive analytics. This research paper explores the application of data science and AI methodologies in predictive analytics, aiming to forecast future trends, behaviors, and outcomes. By leveraging advanced algorithms and machine learning models, such as neural networks, decision trees, and regression analysis, predictive analytics enables organizations to make informed decisions, optimize processes, and gain competitive advantages. This paper delves into the theoretical foundations, methodologies, and real-world applications of data science and AI in predictive analytics, emphasizing the significance of predictive modeling, feature Engineering, and model evaluation. Furthermore, it discusses the challenges, ethical considerations, and future directions in the field, highlighting the need for responsible and transparent use of predictive analytics technologies. Through comprehensive analysis and synthesis of existing literature and case studies, this research paper contributes to the understanding and advancement of predictive analytics leveraging data science and AI techniques.

Keywords: Data Science; Artificial Intelligence; Predictive Analytics; Predictive Modeling.

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Chatbot for Deaf and Dumb People

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ABSTRACT

Communication is a fundamental aspect of human interaction, and individuals with hearing or speech impairments often face significant challenges in this regard. The development of a chatbot specifically designed for deaf and dumb people can provide a valuable solution to bridge this gap and enhance their ability to communicate effectively. This project aims to create a chatbot using the Python programming language that can facilitate seamless communication for deaf and dumb individuals. The chatbot will be designed to understand and respond to text-based messages, enabling users to convey their thoughts and queries without the need for speech or hearing. The proposed system will leverage natural language processing (NLP) techniques to analyze incoming messages and generate appropriate responses. The chatbot will be trained on a diverse dataset of common conversational scenarios, allowing it to understand and respond to a wide range of topics. Additionally, the system will incorporate text-to-sign language translation capabilities, enabling users to receive responses in a visual format that they can easily comprehend. The project's primary objective is to improve the quality of life for deaf and dumb individuals by providing them with a user-friendly and accessible communication tool.

Keywords: American Sign Language (ASL); Natural Language Processing; Computer Vision; Deep Learning.

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Forecasting Stock Prices with Optimized LSTM Network

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ABSTRACT

The capacity to use cutting-edge technologies for perceptive analysis and well-informed decision-making is crucial in the constantly changing financial markets. This study introduces a sophisticated stock market dashboard that uses deep learning and data analytics to offer in-depth understanding of stock market behavior using the use of real-time data from Yahoo Finance, users can analyze historical and intraday stock data, see key performance metrics, and forecast future price movements using this dashboard. To provide users with in-depth market analysis, the dashboard integrates a variety of technical indicators, including Bollinger Bands, Moving Averages, Relative Strength Index (RSI), and Average True Range (ATR). Moreover, future stock price prediction is made possible by the incorporation of a Long Short-Term Memory (LSTM) neural network model, which helps investors make well-informed judgments. The LSTM model predicts price patterns for the next few days with accuracy because it was trained on historical stock data. The dashboard's primary features include actionable buy/sell recommendations based on predictive analytics and dynamic depiction of intraday and daily stock price movements. Users can also examine comprehensive stock data, such as market capitalization, 52-week performance, and business profiles.

Keywords: Stock; Deep Learning; LSTM; Forecasting; Indicators.

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Image Caption Generator

Samrudhi Mahadik and Vijeta Sawant***

ABSTRACT

An "Image Captions Generator" is a software or AI system that automatically generates descriptive text for images. It takes an image as input and produces a textual description, often referred to as a caption that describes the content or context of the image. This technology is commonly used in applications like computer vision, image recognition, and accessibility tools to assist users in understanding and interpreting visual content. It can be particularly useful for making images more accessible to individuals with visual impairments or for automating the process of adding descriptions to large collections of images. The abstract of an image captions generator would typically provide a concise overview of how the system works, its potential applications, and the key technologies or algorithms involved in the caption generation process. This technology combines computer vision and natural language processing to analyze the visual content of an image and produce human-readable text that describes what is depicted in the image. Image captions generators are commonly used in applications like content creation, accessibility for visually impaired individuals, and enhancing user experiences in various domains, such as social media, e-commerce, and image archives.

Keywords: Neural Networks; AI; Machine Learning; CNN, RNN.

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Health-guard: Machine Learning Driven – Disease Prediction and Personalized Recommendation System

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ABSTRACT

In today's fast-paced world, healthcare systems are facing increasing challenges in providing timely and personalized healthcare services. The emergence of large-scale health data and advancements in machine learning offer an unprecedented opportunity to address these challenges. Our project, "Health-Guard," aims to develop a comprehensive machine learning-driven disease prediction and personalized recommendation system to revolutionize healthcare delivery. In this project, we aim to develop a machine learning-based system for predicting multiple diseases based on input patient symptoms and health parameters. The system utilizes supervised learning algorithms including support vector machines (SVM), logistic regression, K-Nearest Neighbors (KNN) etc. to predict disease risk based on patient data, where we are going to use a dataset of electronic health records of thousands of patients to train and evaluate the models. It will provide doctors with probable disease diagnoses for a patient along with confidence scores based on the predictive models. The system will also provide recommended actions and next steps tailored to the predicted diseases such as additional tests, specialist referral, or medication. Our thought behind the project is "PRECAUTION IS BETTER THAN CURE".

Keywords: Machine Learning; K Nearest Neighbors; Support Vector Machines; Logistic Regression.

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Powered Automated Sleep Stage Detection and Classification

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ABSTRACT

Sleep is vital for the body's physical restoration, but sleep disorders can cause various Problems. Determining sleep stages is important for diagnosing and treating such disorders. Polysomnography (PSG) signals are recordings of brain activity, eye movements, muscle activity and their physiological signals that are collected during a sleep study. Insomnia, Sleep Apnea, and Restless Legs Syndrome are some of the sleep problems that can be identified using these signals. However, analyzing PSG signals manually can be time-consuming and prone to errors. Deep Learning Models such as Convolutional Neural Networks (CNN), can be used to automate the analysis of PSG signals. CNN is followed by Long-Short Term Memory (LSTM) and CNN are used as a stack ensemble method to recognize patterns in the signals that correspond to different sleep stages and events. By training these models on large datasets of PSG signals, they can detect the disorders from the sleep stages. The dataset is collected from PhysioNet Sleep-EDF dataset which consists of PSG signals. The accuracies obtained using different training and testing data using CNN and CNN-LSTM are 95.15%and 83.9% respectively, and using metadata classifier the overall accuracy is increased by 1%.

Keywords: Sleep Stage Classification; Deep Learning; Convolutional Neural Network (CNN); Long-short Term Memory (LSTM); Metadata Classifier.

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Flight Fare Exploration using Web Scraping

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ABSTRACT

This study presents an advanced and efficient method for automating the extraction, parsing, and presentation of flight data from EasyMyTrip, Yatra, and Agoda websites using Python-based web scraping techniques. By harnessing the robust capabilities of BeautifulSoup and Selenium libraries, the system streamlines the process of gathering essential flight details such as departure/arrival cities, travel dates, stops, airlines, and fares, ensuring data accuracy and reliability. The extracted information is seamlessly integrated into a user-friendly web page interface, empowering travelers with a comprehensive platform to compare and evaluate flight options across multiple platforms easily. This approach not only enhances user experience by providing clear and concise flight information but also facilitates informed decision-making, ultimately benefiting budget-conscious travelers by saving time and effort in finding and booking the most suitable and cost-effective flight options for their travel requirements. Through comprehensive data comparison, users can make informed choices, optimizing their travel plans for affordability and convenience.

Keywords: Web Scraping; Python; Flight Fares; BeautifulSoup; Selenium.

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Advent of AI in Human Resource Processes

Subhrodipto Basu Choudhury and Shreta Das***

ABSTRACT

Human resource management is not just about administrative tasks; it's about nurturing talent and fostering a conducive work environment. AI integration has revolutionized various HR processes, optimizing efficiency and accuracy. Embracing AI in recruitment enhances candidate sourcing and selection, ensuring the right fit for organizational culture and goals. Additionally, AI-driven analytics in compensation and benefits management streamline decision-making processes, promoting fairness and competitiveness in employee remuneration. Moreover, AI-powered training and development programs personalize learning experiences, catering to individual needs and maximizing skill development. Career succession planning benefits from AI algorithms, identifying high-potential employees, and charting career trajectories for organizational growth. Even in retirement planning, AI assists in optimizing pension schemes and transition processes for retiring employees, ensuring a smooth exit while preserving institutional knowledge. Furthermore, AI's role in updating the parameters of the balanced scorecard reflects its adaptability to evolving organizational strategies, facilitating informed decision-making and strategic alignment. In essence, AI empowers the human resource department to transcend traditional boundaries, driving organizational success in the ever-evolving landscape of the modern workplace.

Keywords: Recruitment; Management; Balance Scorecard; Regulatory.

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Personalized College Recommendations and Chatbot using Machine Learning for MHTCET Applicants

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ABSTRACT

This project aims to develop a predictive model leveraging machine learning techniques to provide personalized college recommendations for students based on their Maharashtra Common Entrance Test (MHTCET) exam scores. The Maharashtra State Common Entrance Test Cell conducts the MHTCET exam for admission to various undergraduate programs in Engineering, pharmacy, and agriculture colleges across Maharashtra. The proposed system utilizes historical MHTCET data along with additional features such as academic records, extracurricular activities, and preferences to build a recommendation engine. The machine learning algorithms employed in this project include regression for score prediction and classification for college recommendation. The model undergoes rigorous evaluation and validation processes to ensure its accuracy and reliability in suggesting suitable colleges for aspiring students. By assisting students in making informed decisions about their higher education choices, this project aims to enhance the efficiency and transparency of the college admission process in Maharashtra. The process of selecting the right college is a pivotal moment in a student's academic journey, influencing their future career prospects and personal growth. In the context of Maharashtra, where the Maharashtra Common Entrance Test (MHTCET) serves as a key determinant for admission to various undergraduate programs.

Keywords: Artificial Intelligence; College Recommendations System; Machine Learning; Chatbot.

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Social Media Trends Analytics

Pooja Singh and Om Kadam***

ABSTRACT

Social media has become an integral part of modern life, influencing communication, commerce, and culture on a global scale. As the volume and diversity of social media content continue to grow exponentially, so does the need for effective analytics to extract valuable insights from this vast ocean of data. Social media trends analytics involves the systematic analysis of social media content, interactions, and behaviors to identify emerging patterns, sentiments, and topics of interest. This paper explores the evolving landscape of social media trends analytics, highlighting key techniques, challenges, and opportunities in this field. We discuss various approaches to data collection, preprocessing, and analysis, including text mining, sentiment analysis, network analysis, and machine learning. In the era of digital interconnectedness, social media platforms have emerged as dynamic ecosystems where users engage in diverse activities, from sharing personal experiences to shaping public discourse. Understanding social media trends has become essential for businesses, marketers, policymakers, and researchers seeking to adapt to rapidly evolving consumer behaviors and societal dynamics. We explore the intricacies of trend detection, tracking, and forecasting across different platforms, considering factors such as virality, engagement metrics, and temporal dynamics.

Keywords: Social Media Trends; Analytics; Machine Learning; Network Analysis; Natural Language Processing.

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A Machine Learning-based Webpage for Predicting Property Prices

*Kaustubh Chaudhary**

ABSTRACT

Accurately predicting real estate prices is critical in navigating the dynamic and complex landscape of urban housing markets. This research addresses the challenge by developing a machine learning-based model for predicting house prices in various urban areas. Leveraging data science techniques, the model incorporates diverse features such as location, area, amenities, and market trends to provide accurate price estimates. Through a comprehensive literature review, we explore the evolution of real estate price prediction methodologies and highlight the limitations of traditional approaches. Adopting a data-driven approach, machine learning algorithms including linear regression, decision trees, random forests, and neural networks are explored for predictive accuracy and robustness. Rigorous data cleaning, feature Engineering, and outlier removal techniques address key challenges such as data quality and dimensionality. The developed model demonstrates promising accuracy, providing valuable insights for buyers, sellers, and real estate professionals across different urban housing markets. Furthermore, the integration of the model into a user-friendly web application enhances accessibility and usability. This research contributes to advancing real estate price prediction by providing a reliable tool for informed decision-making in various urban housing markets.

Keywords: Machine Learning; Data Science; Urban Housing Market; Predictive Modeling; Feature Engineering.

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Music and Movie Recommendation System by Facial Emotions

Hitesh Choudhary, Pranav Khatave**, Sandhya Bankhele***, Pratiksha Gawali**** and Kailash Nath Tripathi******

ABSTRACT

Music and movies are essential in influencing and enhancing one's emotional well-being, serving as significant forms of amusement and motivation. Recent studies emphasize the substantial effect of music and movies on human emotions and cognitive functions. In today's digital age, marked by a surplus of content, the desire for tailored recommendations that resonate with individuals' emotional states has become paramount. This study introduces an innovative recommendation system that utilizes facial expressions to provide personalized movie and music suggestions in real-time through emotion analysis. The system utilizes facial feature detection methods, incorporating the Haar Cascade algorithm and Convolutional Neural Networks (CNN). By incorporating an integrated camera for capturing facial expressions, the system significantly reduces costs compared to other approaches. By merging emotions with advanced technology, this system has the potential to transform the entertainment experience by aligning content with human emotions. It could revolutionize how people discover and interact with digital entertainment, offering a more immersive and emotionally fulfilling journey.

Keywords: Recommender System; Human Emotions; Convolutional Neural Network (CNN); Deep Learning; Personalized Recommendations.

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AI based Educational Chatbot

Azimuddin Patel, Rushikesh Swami**, Aleena Bagwan*** and Nilesh Uke*****

ABSTRACT

This study explores the application of machine learning and artificial intelligence to enhance services, focusing on implementing a chatbot system for college websites. The goal is to provide effective assistance to users by employing natural language processing. The chatbot learns from user inputs and responses, refining its knowledge base for improved accuracy. The project aims to contribute to educational technology by introducing an AI-based educational chatbot capable of multilingual interactions. Users can engage in their preferred language, enhancing accessibility. Unlike traditional chatbots reliant on predefined databases, this system uses machine learning to dynamically train and adapt the chatbot's knowledge. This autonomy allows it to evolve and improve its capabilities, ensuring relevance and accuracy in responses. By exploring the intersection of artificial intelligence, machine learning, and natural language processing, this research advances the development of intelligent educational tools. The findings have implications for improving user engagement, support services, and website accessibility in educational institutions. Through dissemination in a journal paper, this research provides insights and solutions to the academic community and industry practitioners in educational technology.

Keywords: Artificial Intelligence; Machine Learning; Natural Language Processing; Multilingual.

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AI for Wildlife Conservation

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ABSTRACT

This paper presents an innovative AI-driven approach to wildlife conservation, specifically targeting poacher detection. By leveraging YOLOv8 and Roboflow, our system achieves real-time poacher detection. YOLOv8 ensures accurate and efficient detection, while Roboflow streamlines data preprocessing, facilitating seamless integration of diverse datasets. Extensive experiments validate the system's high accuracy and reliability in real-world wildlife surveillance scenarios. The proposed methodology demonstrates promising implications for enhancing wildlife conservation efforts, with its scalability and adaptability making it suitable for deployment in diverse habitats. By effectively detecting and alerting authorities to potential poaching activities, our approach contributes to the preservation of endangered species and biodiversity. This research underscores the pivotal role of AI technologies in addressing pressing conservation challenges and emphasizes the importance of interdisciplinary collaborations in safeguarding our natural heritage. By harnessing the power of machine learning and deep learning algorithms, our methodology offers a proactive solution to combat wildlife crime, complementing traditional conservation efforts and law enforcement strategies.

Keywords: Poacher Detection; Artificial Intelligence; YOLOv8; Roboflow.

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AI based Fashion Design using Machine Learning Algorithms

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ABSTRACT

In the age of online shopping, virtual try-on technology is becoming increasingly important and a considerable amount of research effort is being directed towards this area as a result. Especially appealing here are image-based virtual try-on solutions that do not require specialized hard ware and dedicated imaging equipment, but are applicable with standard intensity images. As illustrated in the goal of such solutions is to replace a piece of clothing in an input image with a target garment as realistically as possible. This allows for the design of virtual fitting rooms that let consumers try-on clothes without visiting (brick and mortar) stores, and also benefits retailers by reducing product returns and shipping costs. While the outlined advances greatly improved the quality of the generated try-on results, the loss of details on the transferred garments that is often a consequence of difficulties with the geometric matching stage still represents a major challenge to image-based virtual try-on solutions.

Keywords: Virtual Try-on; Online Shopping; Virtual Stages; Image-based.

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Concrete Strength Prediction using Machine Learning

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ABSTRACT

Accurate prediction of concrete compressive strength is essential for ensuring structural safety and optimizing material usage in construction projects. Traditional methods involving laboratory testing and empirical formulas are often time-consuming and limited in their predictive capabilities. This research explores the application of machine learning techniques to develop data-driven models for predicting concrete strength based on mixture design parameters. A comprehensive dataset containing information on cement, water, aggregate proportions, admixtures, and age is utilized. Extensive data preprocessing, feature Engineering, and selection techniques are employed to identify the most relevant input variables influencing concrete strength. Multiple machine learning algorithms, including linear regression, random forests, gradient boosting are trained and evaluated. Through rigorous model training, hyperparameter tuning, and cross-validation, the proposed machine learning models demonstrate superior predictive performance compared to traditional empirical methods. The best-performing model achieves high accuracy in estimating concrete compressive strength, with potential applications in optimizing mix designs, reducing costs, and ensuring structural integrity. Furthermore, this research investigates the interpretability of the models, providing insights into the relative importance of different mixture design parameters on concrete strength prediction. The developed data-driven approach offers a valuable tool for enhancing the efficiency and reliability of concrete mixture design in the construction industry.

Keywords: Machine Learning Techniques; Data-driven Models; Data Preprocessing; Linear Regression; Random Forests.

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AI-powered Helmet & Number Plate Recognition for Road Safety

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ABSTRACT

This study presents an AI-powered Helmet & Number Plate Recognition system to revolutionize road safety standards and law enforcement methodologies. Drawing upon cutting-edge computer vision techniques, particularly the YOLO model, the system seamlessly integrates automated helmet detection and precise number plate recognition capabilities. By effectively addressing the limitations of manual monitoring practices, the project endeavors to streamline interactions through an intuitively designed user interface. The methodology employed in this research encompasses a multifaceted approach, beginning with exhaustive data collection procedures. Subsequently, the development of the YOLO model is meticulously executed, ensuring robustness and accuracy in real-world scenarios. Special emphasis is placed on optimizing real-time processing capabilities to facilitate swift and efficient recognition tasks, even in dynamically changing environmental conditions. The performance evaluation of the system is conducted through rigorous quantitative analysis, utilizing key metrics such as precision, recall, and F1 score. These metrics provide invaluable insights into the efficacy and reliability of the system, further reinforcing its potential to enhance road safety measures on a global scale. this research offers valuable insights into the deployment strategies and potential collaborations with law enforcement agencies. It underscores the significant contributions this innovative system can make towards advancing road safety.

Keywords: AI-powered Recognition; Road Safety Enhancement; Law Enforcement Optimization; Computer Vision Techniques.

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Artificial Intelligence in Healthcare

Spurti Desai and Omkar Kale***

ABSTRACT

Man-made consciousness is the frameworks or machines that mirror insight to perform errands and can iteratively work on themselves in light of the data they gather. Computer based intelligence is really used in a large number of setting like clinics, and clinical labs as well as in research draws near. The essential or notable component of computer based intelligence in the clinical field is treatment the executives as well as its determination. Simulated intelligence frameworks in medical care are succeeding a direct result of the high level calculations for learning various qualities from an immense measure of medical care information that aides in critical thinking is accomplished at a rate also, sum purposeless for people. The calculations can be outfitted with auto-figuring out how to get to the next level execution and exactness. Simulated intelligence frameworks are used to work with doctors with cutting edge clinical information about diaries, clinical papers to brief patient consideration and clinical course books. Artificial intelligence can offer less analytic as well as remedial mistakes. For the educational experience, it can utilize clinical information, especially from the patient populace.

Keywords: Artificial Intelligence; Healthcare; Robotic Process Automation; NLP.

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Next-Gen Security Monitoring: Advanced Machine Learning for Assessment in Surveillance

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ABSTRACT

In response to the synergistic evolution of two rapidly advancing technologies, artificial intelligence and edge computing, we introduce a bespoke system termed Next-Gen Security Monitoring system: Advanced Surveillance with Intelligent Environment Detection and Evaluation. This system employs a scalable edge computing architecture and utilizes multitask deep learning to address pertinent computer vision tasks. Acknowledging the diverse potential applications of various surveillance devices, we incorporate a smart IoT module for standardizing video data from disparate cameras. This ensures that the Next-Gen Security Monitoring system adeptly identifies relevant data for specific tasks. Furthermore, deep learning models are deployed at each Next-Gen Security Monitoring system node to perform computer vision tasks on the standardized data. To overcome the typical disparity between training and deployment of deep learning models, especially for related tasks in the same context, we propose a collaborative multitask training approach on a cloud server. Simulation results based on publicly available datasets illustrate consistent support for intelligent monitoring tasks, robust scalability, and enhanced performance achieved through multitask learning. Index Terms: Intelligent video surveillance system, edge computing, deep learning and collaborative learning.

Keywords: Surveillance; Environment Detection; Public Safety; Deep Learning; Edge Computing.

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Gesture Recognition System

Shruti Munde, Payal Hingmire**, Satwik Aghav*** and Amey Raut*****

ABSTRACT

In this paper, an individual human computer interface system using eye motion is introduced. Traditionally, human computer interface uses mouse, keyboard as an input device. This technology is intended to replace the conventional computer screen pointing devices for the use of disabled. The paper presents an idea to control computer mouse cursor movement with human eyes. There are different reasons for which people need an artificial of locomotion such as a virtual keyboard. The main reason we need some alternative and innovative ideas which make our work easier. The project's main objectives to design an accurate and efficient eye-tracking system, develop software to process the captured data, and integrate the software with the computer's operating system to allow hands-free mouse control. The system comprises of an eye tracking device and a software module. The eye-tracking device captures the user's eye movements, while the software module analyses the captured data to determine the intended mouse movements. The software module then communicates the mouse movements to the computer's operating system, allowing the user to interact with the computer hands-free. The project involves the use of machine learning algorithms and computer vision techniques to improve the accuracy of the eye- tracking system.

Keywords: Eye Tracking; Mouse Movement; Eye-blinking Detection; Mouse Tracking.

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A Visual Companion for AI-driven Data Structures and Sorting Methods

*Shital Nalgirkar**

ABSTRACT

Within the realm of computer science education, the mastery of data structures and sorting algorithms serves as a fundamental cornerstone for aspiring programmers. "Coding Clarity: A Visual Guide to Data Structures and Sorting Algorithms" introduces a pioneering initiative aimed at fostering understanding through an inventive web-based platform. This project is dedicated to offering an immersive and interactive educational journey, utilizing state-of-the-art visualizations to simplify complex concepts and cater to learners from diverse backgrounds and skill levels. Central to this initiative is the acknowledgment of data structures as pivotal for efficient data organization and manipulation, alongside sorting algorithms that facilitate systematic element arrangement. Through a dynamic array of visual aids, users are encouraged to engage in hands-on exploration, acquiring profound insights into the underlying principles of these foundational computer science components. Additionally, "Coding Clarity" prioritizes user experience, ensuring seamless navigation and intuitive interaction with educational content. By promoting inclusivity and empowerment, this initiative aims to furnish learners not only with a deeper grasp of core concepts but also the practical abilities and confidence to tackle real-world programming challenges with adeptness and ingenuity.

Keywords: Computer Science Education; Data Structures; Sorting Algorithms; Interactive Learning; Visualizations.

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A Research Survey on Helmet Detection and Number Plate Recognition using Machine Learning

Sonali Nagmode and Sonali Rangdale***

ABSTRACT

These days, it is required for all bike riders to wear a helmet due to the increased number of incidents and poor road conditions. Laws pertaining to safety precautions mandate the use of helmets. However, as of right now, they rely on manual intervention, which is not very successful because bikers occasionally have a tendency to flee after breaking the law, such as by failing to wear a helmet while riding. While automation brings its own set of issues, it is a better solution to this problem than manual labor. Among them are Poor image quality frames, such as those with low pixel density, resolution, and fog, as well as partially hidden faces. The strength of the derived features and the methodology's capacity to handle lower quality extracted data are critical factors that determine how robust the detection process is. This project's primary objective is to increase the effectiveness of helmet detection and then recognizing license plate identification. This methodology suggests using CCTV footage of motorbike riders without helmets to automatically recognize and retrieve their number plates. The system first distinguishes between motorcyclists and non-motorcyclists. Whether or not a biker wears a helmet determines what kind of head they have.

Keywords: OCR; Yolov3; Machine Learning; AI.

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Facial Emotion based Music Recommendation using Convolutional Neural Networks

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ABSTRACT

Facial expressions can be used as a natural means to communicate emotions and have potential applications in the entertainment and human-machine interface domains. While current music players offer features such as reversing, fast forwarding, and streaming playback, users still need to manually search for a song based on their current mood and circumstance. To address this, an intelligent system is proposed that can recognize facial expressions and play a music track accordingly. The system uses the Haar Cascade algorithm and Eigen faces to II.METHODS AND MATERIAL Steps involved to design the system. To design the system, training dataset and test images are considered for which the following procedures are applied to get the desired results. The training set is the raw data which has large amount of data stored in it and the test set is the input given for recognition purpose. The whole system is designed in 5 steps: 1. efficiently extract facial features for emotion recognition. This approach can be applied to various domains, including human-computer interaction and healthcare. While current music streaming services recommend music based on user preferences and listening history, this approach uses physiological and emotional cues captured from facial expressions, gestures, pulse rate, movement.

Keywords: Music Recommendation; Convolutional Neural Networks; Facial Emotion; CNN.

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Natural Language Processing

Prajwal Shankarshetty, Tushar Minche** and Darshana Bhamare****

ABSTRACT

This research paper provides an in-depth exploration of Natural Language Processing (NLP), covering its historical development, fundamental principles, recent advancements, and comparative assessments. It traces the evolution of NLP from its origins to its current state, discussing significant milestones such as the emergence of rule-based systems, statistical approaches, and modern deep learning architectures. The paper examines essential NLP techniques including text preprocessing, statistical modeling, and neural network architectures, illustrating their significance in various tasks such as language modeling, part-of-speech tagging, and machine translation. Additionally, recent breakthroughs like pretrained language models and multimodal NLP are explored, alongside discussions on emerging trends and challenges in the field. Through comparative analyses of different NLP approaches, the paper offers insights into their respective strengths, weaknesses, and performance characteristics. Moreover, ethical considerations such as bias, fairness, and privacy in NLP models are addressed, emphasizing the importance of responsible development practices. In summary, this paper aims to provide a thorough overview of NLP research, setting the stage for further exploration and innovation in this rapidly evolving domain.

Keywords: Working of NLP; NLP Application; Case Study; Challenge and Future Prediction.

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Next-GPT: A Versatile Multimodal Language Model for Any-to-Any Conversion

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ABSTRACT

Next-GPT represents a groundbreaking advancement in AI language models, boasting unparalleled versatility in facilitating seamless conversion across diverse modalities. By integrating cutting-edge techniques from natural language processing, computer vision, and audio processing, Next-GPT transcends traditional boundaries, enabling fluid transformation of text, images, audio, and more. Its multifaceted capabilities encompass tasks ranging from transcribing speech to generating descriptive captions for images, translating between languages, and even converting text to music. This versatility stems from its robust architecture and extensive training data, which empower Next-GPT to comprehend and generate content across an expansive spectrum of domains and languages. With Next-GPT, the limitations of conventional language models are surpassed, ushering in a new era of communication and expression. It's potential for innovation and collaboration spans creative endeavors and practical applications alike, promising to revolutionize how we interact with and harness the power of artificial intelligence. Next-GPT stands at the forefront of AI research, poised to redefine the landscape of multimodal language processing and unlock new frontiers in human-machine interaction.

Keywords: Multimodal Language Model; Any-to-any Conversion; Versatile AI; Cross-modal Transformation; Innovation in AI.

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AI-driven Optimization of Neuro-prosthetic Devices

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ABSTRACT

In this study, we explore the intriguing field of neuro-prosthetics and the ways in which artificial intelligence (AI) is changing it. In order to optimize neuro-prosthetic devices, we concentrate on the integration of edge computing platforms with deep learning algorithms. We describe a portable, self-contained neuro-prosthetic hand in our work. Based on the Recurrent Neural Network (RNN) architecture, a neural decoder is used to control this device. This decoder, which enables real-time control of individual finger movements, is installed on a small-sized but capable edge computing platform. Our system has proven to have low latency and good accuracy control in a variety of testing scenarios. We also investigate the application of self-governing learning agents to the enhancement of neuro-prosthetic treatments. We talk about how huge parameter spaces for neurostimulation can be explored using Gaussian-Process-based Bayesian Optimization. Our findings lend credence to the notion of integrating learning agents into the structural architecture of neuro-prosthetics. This strategy optimizes the efficacy of interventions while allowing for therapeutic customisation.

Keywords: Deep Learning; Edge Computing; Recurrent Neural Networks; Neuro-prosthetics; Bayesian Optimization.

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Ensemble Machine Learning in Algorithmic Trading: Balancing Performance and Risk

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ABSTRACT

This research delves into the potential of ensemble machine learning in algorithmic trading, aiming to strike a balance between performance and risk management. In the increasingly intricate landscape of financial markets, employing ensemble approaches that amalgamate multiple models becomes imperative. The study elucidates how these techniques enhance the accuracy, resilience, and adaptability of algorithmic trading systems. It further emphasizes the significance of model variability, hyperparameter tuning, and the bagging ensemble learning technique for optimizing outcomes. Moreover, the research scrutinizes the benefits of ensemble learning for algorithmic trading portfolios, particularly in terms of tail risk management and risk diversification. By utilizing ensemble approaches, several advantages emerge, including mitigated model bias, heightened generalizability, and an improved Sharpe Ratio. Ensemble methods enable traders to navigate market complexities more effectively, adapting to changing conditions and reducing the impact of outliers. This comprehensive approach not only enhances trading performance but also fortifies risk management strategies, making it indispensable in today's dynamic financial environment.

Keywords: Ensemble Machine Learning; Algorithmic Trading; Risk Management; Performance; Stock Market Forecast.

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Arduino based Home Appliance Control using Android Application Home

Samruddhi Jadhav, Krishna Dhikale**, Swapnil Dond*** and Hrishikesh Damale*****

ABSTRACT

This paper presents an imaginative way to deal with home machine control utilizing Arduino innovation and a portable application interface. The framework intends to upgrade client comfort and energy productivity by permitting remote observing and control of family gadgets through a cell phone or tablet. Utilizing Arduino's flexibility and availability, different machines like lights, fans, and electronic contraptions are interacted with Arduino microcontrollers, empowering them to be controlled remotely. The versatile application fills in as the focal center point, furnishing clients with natural connection points for overseeing various machines, setting timetables, and checking energy utilization. Through this coordination of equipment and programming, clients gain more noteworthy adaptability and robotization in dealing with their home climate, prompting further developed accommodation, energy reserve funds, and generally speaking way of life upgrade. This study presents an Arduino-based system for home machine control, consistently incorporated with a versatile application interface. By outfitting the force of Arduino microcontrollers and versatile innovation, this framework offers a high level degree of robotization and customization to current families. Through the versatile application, clients can remotely work machines, change settings, and even make customized plans custom-made to their day to day schedules.

Keywords: Arduino; Home Appliances; Mobile Application; Home Automation.

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Automated Weapon System

Sejal Abraham and Palak Pandey***

ABSTRACT

This paper provides insights from case studies and real-world situations among varying public perceptions and arguments around the ethical and humanitarian elements of autonomous weapon systems. It summarizes lessons learned and emphasizes the necessity of encouraging responsible re-search, deployment, and regulation by examining certain conflicts and events involving automated weapon systems. The ethical and strategic issues raised by automated weapon systems are addressed in this study by advocating for a comprehensive strategy. It highlights how crucial it is to create moral standards, include human monitoring procedures, and promote responsibility and openness in the creation and application of these technologies. This article attempts to contribute to the responsible stewardship of automated weapon systems in the goal of international peace and security by directing policy de-liberations and fostering informed conversation. An autonomous weapon system has a predetermined "target profile" that it is designed to kill. After that, the weapon is released into a setting where its artificial intelligence (AI) uses sensor data, including facial recognition, to look for that "target profile. The weapon fires and kills when it comes into contact with something or someone that the algorithm determines matches its target profile.

Keywords: Slaughter Bot; Autonomous; Automated Weapon System; Killer Bot.

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Bridging the Healthcare Divide: A Seamless Multimodal Interface for Virtual Healthcare

Atharva Gade, Siddhi More**, Anushka Kumbhar*** and Mayur Shewale*****

ABSTRACT

The backdrop of our contemporary global landscape, an increasingly health-conscious populace grapples with a formidable challenge—while the demand for healthcare has surged, the availability of human resources in the medical profession falls woefully short, leaving a significant portion of patients without timely and adequate care. This stark reality underscores the pressing need for innovative solutions that bridge the gap between patient needs and available medical expertise. Amid this healthcare imbalance, numerous studies have illuminated a promising path forward: the integration of advanced technologies, particularly chatbots and health assistants, to provide a responsive and accessible avenue for individuals seeking medical guidance. This paper endeavors to delve into the expansive realm of chatbots, aiming not merely to address the shortage of healthcare professionals but to elevate the quality of healthcare accessible to individuals globally. The integration of NLP and Voice over can bring a revolution in the Healthcare Industry and also in detecting various diseases

Keywords: NLP; Speech Recognition; Language Interpretation; Augmented Reality; UML to Craft a Groundbreaking Virtual Healthcare Assistance Framework.

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Machine Learning-based Stress Detection in Real-world Scenarios: A Comprehensive Review

*Dipti Deshpande**

ABSTRACT

In today's world, stress plays a vital role in the development of many diseases. This comprehensive paper examines current research on different strategies for identifying stress in daily life. By reviewing current research, the paper provides insights into strategies and methods for identifying stressors in daily life. There is a dearth of studies that particularly examine how stress is recognized in everyday, real-world scenarios, despite the fact that research of stress detection under controlled lab conditions do exist. This study provides a detailed overview of using machine learning to detect stress. It evaluates the effectiveness of various algorithms, ranging from complex deep learning models to traditional statistical methods. By analyzing detection techniques and reviewing existing literature, the research contributes to the advancement of technology-driven mental health interventions. Essentially, the study sheds light on how machine learning can be leveraged to identify stress in individuals, thereby aiding in the development of innovative approaches to mental health support.

Keywords: Stress Detection; Machine Learning; Deep Learning Models; Mental Health Interventions.

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Cyber Security, BlockChain and Cloud Computing

Blockchain-based Device Lifecycle Tracking: Enhancing Sustainability and Transparency

Pranav Kale, Nita Mahale** and Onkar Andurkar****

ABSTRACT

The rapid increase in the use of electronics has created the problem of e-waste disposal, which includes the life cycle of e-waste and impact on the environment. An answer to this could be the best option that uses blockchain technology to control the life cycle of electronic devices through this study. Our solution leverages these high-quality qualities of transparency, stability and immutability that blockchain offers to ensure improved sustainable practices are adopted, increasing environmental literacy and ultimately helping with proper disposal. Converting the road into a roadway for various other activities that would have required open space would then be the focus of this project. The aim of this study is to explore how blockchain can help simplify device management and use the distributed ledger to track entire device history, ownership, repairs and even end-of-life disposal. A literature review will allow us to carefully assess the corpus of existing research on blockchain technology, device lifecycle tracking and environmental pollution that can be effectively applied in these areas.

Keywords: Blockchain; Device Lifecycle Tracking; Sustainability; Electronic Waste; Smart Contracts.

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Fake Medicine Identification using Blockchain Technology

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ABSTRACT

Counterfeit medicines pose a significant threat to public health, demanding innovative solutions for detection and prevention. This paper presents a groundbreaking approach utilizing blockchain technology to address the proliferation of counterfeit pharmaceuticals. Leveraging blockchain's immutable and transparent ledger, the proposed system meticulously tracks the entire pharmaceutical supply chain, from production to consumption. Stakeholders, including consumers, healthcare providers, and regulatory authorities, can verify medicine authenticity accurately. The secure and decentralized platform ensures transparency and traceability, mitigating risks associated with counterfeit drugs. Smart contracts automate verification processes, enforcing predefined authenticity criteria. By fostering trust and accountability, the solution aims to safeguard global public health. Beyond counterfeit detection, it enhances pharmaceutical safety and efficacy, boosting consumer confidence and regulatory oversight. As counterfeit medicines continue to threaten healthcare integrity globally, this paper represents a pivotal step in fortifying the pharmaceutical supply chain. Through ongoing research and adoption of blockchain-based solutions, we can effectively combat counterfeit medicines, ensuring access to safe pharmaceuticals for all.

Keywords: Counterfeit Medicines; Blockchain Technology; Pharmaceutical Supply Chain; Smart Contracts; Authenticity.

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Crowdfunding using Blockchain Technology

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ABSTRACT

Cryptocurrencies are a game-changer in the world of fund and crowdfunding. They offer a secure and decentralized way for businesses to produce reserves. Not at all like conventional crowdfunding websites, have cryptocurrency frameworks given straightforwardness and control over given reserves. Social media and crowdfunding stages make it simpler than ever to pull in financial specialists and business people. Cryptocurrencies can provide business people get to worldwide capital, progress straightforwardness, and lower exchange costs. In any case, it is critical to be mindful of the dangers, such as showcase instability, security concerns, and administrative issues. It is an energizing field with parts of potential. Cryptocurrency, like Bitcoin, has picked up ubiquity as a decentralized computerized cash, and crowdfunding has gotten to be a well-known way for new businesses and ventures to raise stores. High-level dialects such as Robustness give a theoretical and user-friendly approach to creating keen contracts for crowdfunding stages. These dialects offer a more available way for engineers to make and oversee exchanges, guaranteeing straightforwardness and security. Investigating the crossing point of blockchain innovation, high-level dialects, and crowdfunding can give profitable experiences into the future of fund and raising money.

Keywords: Crowdfunding; D-app; Secure; Transparent.

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Artificial Intelligence and Machine Learning in Cyber Security

Gaurav Waghmare and Shreya Nalawade***

ABSTRACT

The integration of Artificial Intelligence (AI) and Machine Learning (ML) techniques into cybersecurity frameworks has revolutionized threat detection, mitigation, and response mechanisms. Leveraging AI algorithms, such as deep learning neural networks and reinforcement learning models, enables the identification of complex patterns and anomalies within vast datasets, facilitating proactive threat intelligence and predictive analysis. ML algorithms augment traditional cybersecurity measures by autonomously adapting to evolving threats, enhancing the detection of sophisticated malware, zero-day exploits, and insider threats. Moreover, AI-driven cybersecurity solutions offer real-time threat monitoring and response capabilities, bolstering organizations' resilience against cyber attacks. However, the deployment of AI and ML in cybersecurity introduces challenges related to data privacy, model interpretability, and adversarial attacks. Addressing these challenges requires interdisciplinary collaboration among cybersecurity experts, data scientists, and ethicists to develop robust AI-driven security solutions that safeguard sensitive information and uphold ethical principles. This paper explores the synergistic relationship between AI, ML, and cybersecurity, elucidating their transformative potential in fortifying digital ecosystems against evolving cyber threats.

Keywords: AIML; Cybersecurity; Vulnerability; Malware; Hacking Principals.

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Graphical Secret key Verification Framework

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ABSTRACT

Graphical secret word is one of method for verification of Computer security. Presently days advanced/Computer security is most significant things in software Engineering for safeguarded client or client information. Furthermore, Shoulder-surfing is a one of the dangers where a lawbreaker can take a secret key by direct perception or by recording the verification meeting. There are a few procedures accessible for this confirmation, the most pervasive and straightforward of which is the Graphical secret key method. Thus, we recommend another strategy to battle this issue. You ought to pick secret word as indicated by the enlistment secret word, it must to match at login time. In variety base validation, there ought to be a few variety base passwords and contingent upon the variety, you want to recollect the secret key succession. Also, it's like three-factor verification. Thus, here is proposed another graphical secret word validation method that is versatile to bear surfing and furthermore to different kinds of likely assaults.

Keywords: Computer Confirmation; Computer Authentication; Graphical Secret Key; Computer Security.

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Cybersecurity Threats, Countermeasures and Mitigation Techniques on the IoT: Future Research Directions

Tanaya Mankawade and Prashik Patil***

ABSTRACT

The Internet of Things (IoT) interconnects physical and digital objects embedded with sensors, software, and different technology, which exchange information using the Internet. This generation allows billions of devices and those to speak, percentage statistics, and customise offerings to make our lives less difficult. Despite the couple of advantages offered with the aid of IoT, it may additionally constitute an essential trouble due its loss of statistics security. Since the variety of IoT gadgets has been rapidly growing all over the sector, they've grow to be a goal for lots attackers, who try to scouse borrow sensitive facts and compromise people's privateness. As a part of the IoT environment, information and services must be blanketed with capabilities together with confidentiality, accuracy, comprehensiveness, authentication, access manipulate, availability, and privateness. Cybersecurity threats are precise to the Internet of Things, which has specific characteristics and limitations. In consideration of this, an expansion of threats and assaults are being released every day towards IoT. Therefore, it's far essential to identify these types of threats and locate solutions to mitigate their dangers.

Keywords: Internet of Things (IoT); Cybersecurity; Assault; Vulnerabilities.

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Cyber Terrorism: The Dark Side of Digital World

Om Solanke, Aayush Kapse**, Vedant Desai*** and Kirti Randhe*****

ABSTRACT

Cyberterrorism, characterized by the purposeful use of technology to spread fear, disrupt services and cause harm to individuals or nations, has become a formidable threat in the digital landscape is interconnected. This paper delves deeper into the multifaceted field of cyberterrorism, aiming to provide a comprehensive analysis of its origins, tactics, impacts, and countermeasures. The study begins by contextualizing cyberterrorism within the broader spectrum of cyberthreats, describing the distinct characteristics that distinguish it from conventional forms of terrorism. Based on a meticulous literature review including scientific articles, government reports and cybersecurity analysis, this article sheds light on the historical development of cyberterrorism, from cases of early digital sabotage to sophisticated cyber warfare tactics used by state and non-state actors.This paper explores the critical role of advanced threat detection systems in bolstering cybersecurity defenses against evolving cyber threatBy leveraging cutting-edge technologies such as machine learning and anomaly detection, these systems offer proactive protection, rapid threat response, and mitigation strategies. Through a comprehensive analysis of current cyber threats and the effectiveness of detection mechanisms, this study highlights the importance of continuous innovation and collaboration in safeguarding digital assets and ensuring resilient cybersecurity frameworks.

Keywords: Cyber; Security; Threats; Cyber security; Terrorism.

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Other Emerging Trends in Engineering and Technology

Artificial Intelligence in Space Operation

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ABSTRACT

Artificial Intelligence (AI) plays a pivotal role in revolutionizing space operations by enhancing efficiency, safety, and decision-making processes. In the realm of autonomous navigation, AI enables spacecraft to navigate complex trajectories, avoid collisions, and optimize fuel consumption. Data analysis powered by AI algorithms processes vast amounts of telemetry data to extract meaningful insights, monitor spacecraft health, and detect anomalies. Mission planning and optimization benefit from AI-driven algorithms that optimize resource allocation, schedule activities, and improve mission success rates. Robotics and automation in space operations leverage AI for autonomous robotic tasks, such as assembly, maintenance, and repair of spacecraft and infrastructure. Natural language processing facilitates human-machine interaction, enabling seamless communication and control of space systems. AI-based space weather prediction models enhance situational awareness and mitigate risks posed by space weather events. Image and video analysis powered by AI algorithms enhance remote sensing capabilities, enabling high-resolution imaging, object recognition, and terrain mapping. Resource management in space operations benefits from AI- driven algorithms for efficient utilization of energy, water, and other resources aboard spacecraft and space habitats. Deep space communication systems leverage AI for optimizing data transmission, reducing latency, and ensuring reliable communication over vast distances.

Keywords: Artificial Intelligence; Deep Space Communication; Human-machine Interaction; Space Operation.

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Enhancing Cross-cultural Communication: Rule-based Marathi to Gujarati Text Translation (Part-II)

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ABSTRACT

In today's globalized landscape, the diversity of languages presents significant obstacle to effective communication and information dissemination. This paper presents the culmination of our efforts in developing rule-based Marathi to Gujarati Text Translator, This paper delves into the refinement and enhancement of the translation system. The primary goal of this project to overcome language barriers and facilitate seamless communication between Marathi and Gujarati speakers. Employing rule-based Natural Language Processing (NLP) techniques, our translator aims to deliver precise and contextually appropriate translations. We strive to capture the nuances of each language, ensuring accurate and culturally sensitive interpretations. This paper provides a comprehensive overview of our project, detailing its objectives, methodology, and system requirements. We highlight the iterative nature of our development process, incorporating feedback and refining algorithms to improve translation accuracy and fluency. Additionally, we discuss the incorporation of advanced linguistic features, such as part-of-speech tagging and noun identification, to enhance translation quality. Furthermore, we address the potential societal impact of our translator, emphasizing its role in fostering cross-cultural understanding and promoting inclusivity. By facilitating communication across linguistic boundaries, our system contributes to the enrichment of cultural exchange and access to information, aligning with Mass Technologies' commitment to supporting diverse societies.

Keywords: Rule-based Translation; Machine Translation; Marathi to Gujarati Translation; NLP; Rule based Text Translator.

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Awareness and Adoption of Pin-less Digital Payments in India

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ABSTRACT

This research is about the Awareness and Adoption of pin-less digital payments in India, which examines the factors influencing pin-less digital payments. This research employs quantitative and qualitative methods to investigate the role of perceived ease of use, facilitating conditions, and usefulness in driving the adoption of this Pin-less payment solution. The findings reveal the effect of pin-less digital payment on banking. As of 2023, India has over 300 million UPI handles and 945 million debit cards, indicating a large number of digital payment adoption. The digital payment market in India is expected to reach 10 trillion by 2026, with 117.6 billion annual transactions in the year 2023. However, this research highlights the challenges in the current UPI system, where transactions directly by using bank accounts impact the Core Banking System (CBS), leading to transaction failures due to the high volume of transactions. NPCI has released UPI Lite, a technology designed to handle huge numbers of transactions efficiently. This finding will emphasize the need for targeted interventions to bridge the digital divide and the potential of pin-less payments in India.

Keywords: Pin-less Digital Payments; Adoption; Awareness; Financial Inclusion; Digital Divide.

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Commerce Craft: Advanced E-commerce Solutions

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ABSTRACT

This paper presents the development process of an e-commerce website tailored for buying and selling goods. With the ever-growing prominence of online commerce, the need for efficient and user-friendly platforms has become paramount. This project was initiated to address the challenges and opportunities inherent in this dynamic landscape. The primary aim of this research was to design and implement a robust e-commerce platform that facilitates seamless transactions between buyers and sellers while ensuring a satisfying user experience. To achieve this objective, a comprehensive methodology was employed, encompassing various stages such as requirement analysis, design prototyping, development, testing, and deployment. The methodology involved collecting data through market research, user surveys, and consultations with stakeholders to identify key features and functionalities essential for an effective e-commerce platform. Subsequently, the data were analyzed to prioritize features, determine technical requirements, and establish a user-centric design approach. The development phase utilized industry-standard technologies and frameworks to build a scalable, secure, and responsive website. Key functionalities included user authentication, product catalog management, shopping cart functionality, payment processing integration, and order management systems. Throughout the process, rigorous testing procedures were implemented to ensure the functionality, performance, and security of the platform.

Keywords: Economic Impact; E-commerce Development; User Experience; E-commerce.

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Cropsmart: Web-based Insights for Smarter Crop Decisions

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ABSTRACT

The crop recommendation system is a technological solution designed to aid farmers in making informed decisions about which crops to cultivate on their land. Agriculture, being highly dependent on environmental factors such as soil type, climate, and weather patterns, requires careful consideration when selecting crops to maximize yield and profitability while minimizing risks. This system utilizes advanced data analytics and machine learning algorithms to analyze various input parameters provided by the farmer. These parameters typically include soil pH, nutrient levels, temperature, rainfall patterns, historical crop performance, and farmer preferences. By processing this data, the system generates personalized recommendations tailored to the specific conditions and requirements of each farm. The recommendations provided by the system take into account several factors, including the suitability of different crop varieties to the soil and climate conditions, the expected yield potential of each crop, market demand and prices for various crops, as well as the overall profitability of cultivating each recommended crop. Additionally, the system can help farmers mitigate risks associated with crop failures or poor yields by recommending crops that are better suited to their specific environmental conditions.

Keywords: Agriculture; Analytics; Algorithms; Time Management.

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SAAS Application: AI Tools

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ABSTRACT

This paper explores the transformative impact of artificial intelligence (AI) on the software-as-a-service (SaaS) industry, highlighting its pivotal role in automating tasks, enhancing customer service, and facilitating data-driven decision-making. We delve deeply into the diverse applications of AI in SaaS, thoroughly examining its contributions to task automation, customer service improvement, and data analysis. Despite its numerous benefits, successful AI implementation in SaaS necessitates addressing challenges such as data quality, explainability, and ethical considerations. To empower users across various domains with AI capabilities, we present the design and implementation of a comprehensive website serving as a platform for hosting a wide range of AI tools, including conversational agents, code generators, image synthesis models, and audio & video generation algorithms. Through meticulous user studies and rigorous performance evaluations, we unequivocally demonstrate the effectiveness and usability of the platform, providing invaluable insights into its potential for driving innovation and efficiency in SaaS applications.

Keywords: Software-as-a-service (SaaS); Artificial Intelligence (AI); AI Implementation; Task Automation; Data-driven Decision-making.

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Design and Manufacturing of Mechanism for Emergency Exit in Building

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ABSTRACT

In this paper the design and fabrication of mechanism for emergency exit in the building are introduced. For escaping high rise building is very important in case of fire, terrorist attack accident or any other cases. This machine is intended to provide an evacuee with an alternative evacuation route that is only to be used as a last resort during emergency situations. If the primary roots of exit are unavailable overwhelmed or obstructed in any way. The prototype machine's experiment demonstrates that it can release an escapee in a timely manner and increase the evacuee's safety and efficiency. This machine is developed to provide the user and serve ability into the building evacuation system when the stairs and elevators are not possible or damaged. The machine which we have designed here is suitable for any age group or any weight. This prototype is designed for 100 kg load, the machine is equipped with unique governor mechanism for downfall speed control and speed can be adjusted instantly. The machine is reusable again and again, any quantity of evacuee can escape through this machine. Experiments of its prototype in results, shows that this equipment can release evacuee on time with safety.

Keywords: Emergency Exit; Safety Evacuee's; Prototype Model; Design and Fabrication.

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Design and Fabrication of Transmission System of Electric Vehicle

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ABSTRACT

The urgent need to mitigate climate change and reduce dependence on fossil fuels has led to a surge in interest in renewable energy sources for transportation. This project focuses on the design and development of a solar-based electric car, aiming to harness solar energy as a primary power source to propel the vehicle. The integration of solar panels directly onto the car's surface offers a sustainable solution for extending the range and reducing the environmental impact of electric vehicles. The project begins with extensive research into existing solar car technologies, including solar panel efficiency, energy storage systems, and electric vehicle design principles. Through iterative design processes and Engineering simulations, the team explores various configurations to optimize the aerodynamics, weight distribution, and energy efficiency of the vehicle. Utilizing advanced materials and manufacturing techniques, such as lightweight composites and 3D printing, enables the construction of a streamlined and energy- efficient car body. Furthermore, the development of an intelligent energy management system plays a crucial role in maximizing the utilization of solar energy while ensuring efficient battery charging and discharging cycles. Integration of regenerative braking technology enhances energy recovery during deceleration, contributing to overall energy efficiency and range optimization.

Keywords: Solar Energy; Battery; Transmission System; Controller; Motor.

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Automated Personal Assistant

*Shivendra Ghadage**

ABSTRACT

In today's digital era, personal AI assistants have become integral parts of our daily lives, offering a range of functionalities to assist us in various tasks and activities. This abstract delves into the world of personal AI assistants, providing an accessible overview of their features and benefits. Personal AI assistants, such as Siri, Alexa, and Google Assistant, are designed to understand and respond to human commands and inquiries. They can perform tasks like setting reminders, sending messages, playing music, and providing weather updates with just a voice command or a few taps on a screen. These AI assistants utilize advanced technologies such as natural language processing (NLP) and machine learning to continuously improve their understanding of user preferences and behaviors. Through interaction and data analysis, they tailor their responses and recommendations to suit individual needs, making them. In this era of digital transformation, the demand for personal AI assistants is burgeoning, aiming to streamline daily duties, improve productivity, and decorate user experience. Our challenge specializes in growing a Personal AI Assistant the usage of Python, leveraging natural language processing (NLP), machine gaining knowledge of, and different superior strategies to cater to numerous person wishes successfully.

Keywords: Speech Recognition; NLTK; Sckit-learn; PyTorch; TensorFlow.

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Language Translator

Vijayalaxmi Biradar, Atish Shide**, Mayuri Barmade*** and Omkar Potdar*****

ABSTRACT

This theoretical presents a language interpreter Android application enabled by Regular Language Handling (NLP) innovation. It intends to address correspondence obstructions by offering constant interpretation of text or discourse across various dialects. The application bridles NLP calculations to fathom the complexities of human language, including informal articulations and setting, in this way guaranteeing exact and regular interpretations. Through constant client cooperation, the application persistently learns and further develops its interpretation abilities over the long haul. The UI is intended to be instinctive and available, working with consistent communication for clients. By utilizing the force of NLP, this application looks to upgrade correspondence and joint effort in our interconnected world, separating language hindrances and encouraging worldwide availability.an Android application engaged by state of the art Customary Language Taking care of (NLP) innovation, pointed toward handling correspondence obstructions through constant interpretation. Utilizing NLP calculations, it appreciates human language complexities, guaranteeing exact interpretations in any event, for everyday articulations. Through continuous client communication, the application persistently learns and further develops its interpretation capacities. With a natural and open UI, it means to reform diverse correspondence, encouraging worldwide network and making it more straightforward for individuals to associate and see each other easily.

Keywords: Language Interpreter; Android Application; Regular Language Handling (NLP); Communication Enhancement; Real-time Translation.

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Empowering Democracy: Leveraging Blockchain Technology for Cutting-edge E-voting Systems

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ABSTRACT

The examination of the potential for revolutionizing electronic voting (E-voting) systems through the application of blockchain technology is the central focus of investigation within the scope of this particular research endeavor. The primary aim of this scholarly inquiry is to shed light on the critical significance of secure and transparent voting mechanisms in the context of democratic governance. Delving into the evolution of voting methodologies across temporal epochs, the study elucidates the challenges that traditional modes of balloting often grapple with in contemporary societies. By delineating the key objectives of this scholarly article, it becomes apparent that a key aim is to present an overview of blockchain technology while underscoring its inherent attributes that render it particularly apt for enhancing the integrity of electoral systems. Through a thorough examination of pertinent literature on the applications of blockchain technology in conjunction with electronic voting systems, this research endeavor aims to contribute substantively to the ongoing discourse surrounding the intersection of democratic processes and technological advancements.

Keywords: Evolution of Voting Systems; Secure Voting; Cryptographic Security; Empowering Democracy; Blockchain e-voting.

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Creating Effective Learning Environment by Creating Effective Teaching

Rajashekhar Talikoti and Prafulla Kulkarni***

ABSTRACT

The changes in learning management typically involve the introduction of various alternative learning methods. The development of an effective learning experience requires the modification of conventional learning. Teaching and learning constructively synchronize instructions and assessment toward the desired learning outcomes. Notwithstanding the vast literature on the creation of effective learning, the lack of explanation on how the relationship between effective teaching and effective classroom would likely leave practitioners and academia without a clear guidance on how to operationalize the creation of effective learning in real life. A systematic literature review procedure was conducted upon published papers till now in outstanding education journals. This article contributes to the literature by amassing the knowledge on pedagogical practices in effective learning creation. In addition, to obtain a granular elaboration about the matter, a framework to operationalize the creation of effective learning is suggested. Three aspects compose the framework namely teachers' intrinsic capabilities, educational institution support, and student's participative involvement. The roles of each party were extracted from the knowledge contained in the reviewed literature. Special requirements of NEP-2020 are highlighted and relevant suggestions are noted.

Keywords: Management of Effective Teaching; Management of Effective Classroom; NEP-2020; Participative Learning.

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Vibrational and PED Analysis of p-Nitro Aniline - A DFT Study

Deepak Kulshreshtha, P. K. Srivastava** and M. P. Yadav****

ABSTRACT

The study you described sounds comprehensive and thorough! Using density functional theory (DFT) with the B3LYP functional and a 6-31** G(d, p) basis set is a common approach for calculating molecular geometries and vibrational spectra of organic molecules like p-Nitroaniline. DFT is particularly useful because it provides a good balance between computational cost and accuracy. Calculating infrared intensities, reduced mass, and force constants provides valuable information about the vibrational properties of the molecule. Assigning vibrational frequencies using potential energy distribution (PED) analysis through tools like Vibration Energy Distribution Analysis (VEDA) 4 allows for a detailed interpretation of the vibrational modes. Additionally, investigating thermodynamic properties like heat capacity, zero point energy, and entropy helps in understanding the molecule's stability and reactivity under various conditions. Studying the Highest Occupied Molecular Orbital (HOMO) and Lowest Unoccupied Molecular Orbital (LUMO) provides insights into the molecule's electronic structure, including information about charge transfer processes within the molecule. Overall, the agreement between the calculated vibrational frequencies and experimental values indicates the reliability of the DFT/B3LYP method with the chosen basis set for studying vibrational spectra of molecules like p-Nitroaniline.

Keywords: DFT- Calculations; IR Spectra; PED; HOMO; LUMO.

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