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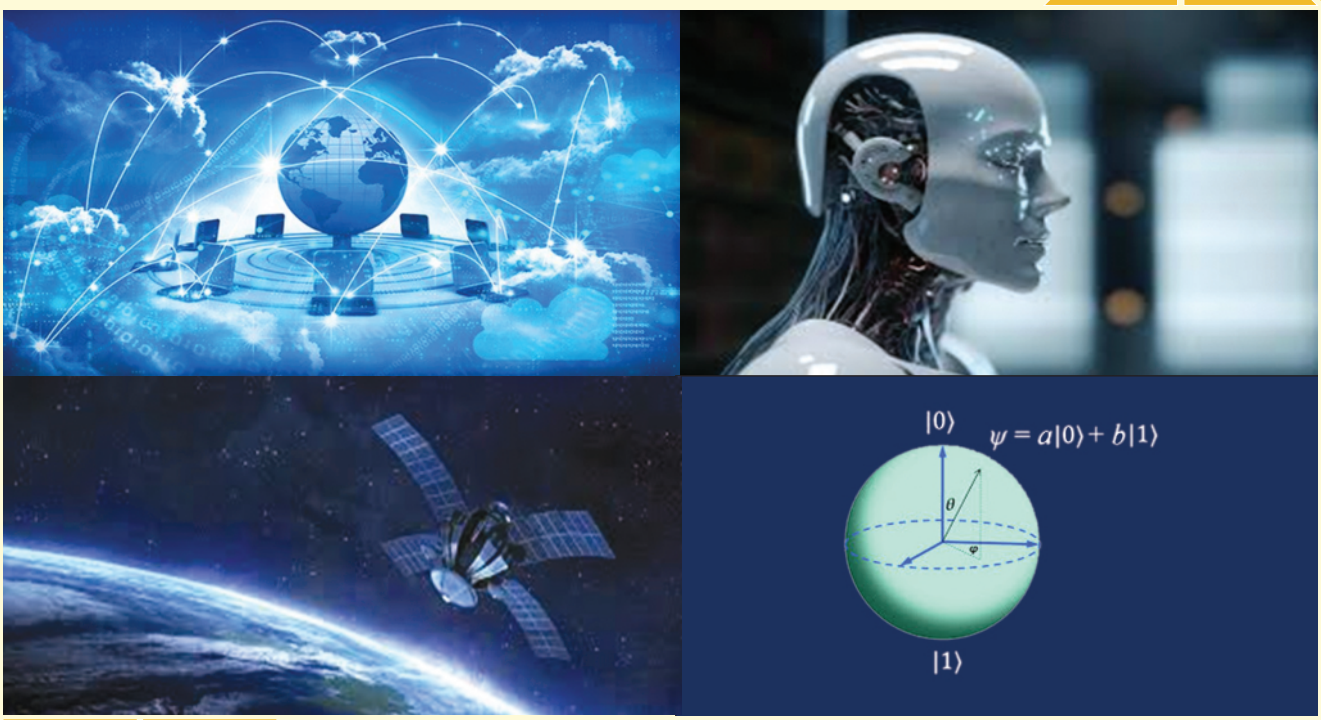
IEEE International Conference on

INTELLIGENT CONTROL, COMPUTING AND COMMUNICATIONS

(IC3-2025)

(IEEE Conference Record No. 63308)

February 13-14, 2025



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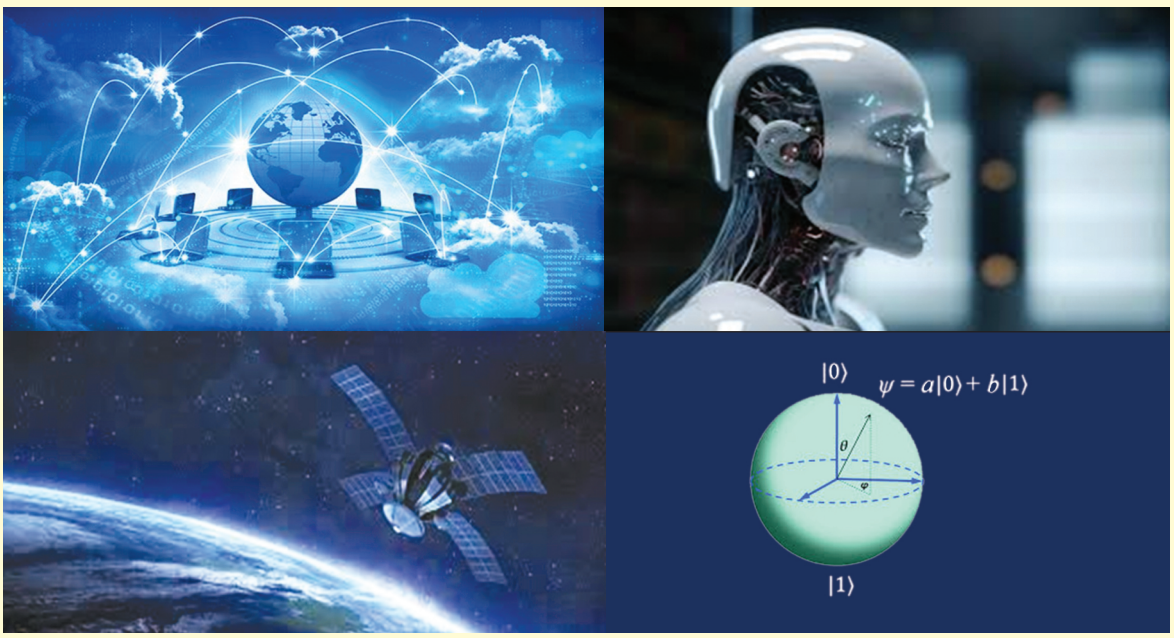

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INTELLIGENT CONTROL, COMPUTING AND COMMUNICATIONS

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Anandiben Patel
Governor, Uttar Pradesh

सत्यमेव जयते

Raj Bhavan
Lucknow - 226 027

03 February, 2025

Message

It is heartening to learn that GL Bajaj Group of Institutions, Mathura is organizing the IEEE International Conference on Intelligent Control, Computing, and Communications (IC3-2025) on February 13-14, 2025.

In the rapidly evolving landscape of technology, such conferences play a pivotal role in fostering research, innovation and collaboration among academicians, industry experts and scholars. I am confident that this conference will serve as a platform for valuable discussions, knowledge exchange and groundbreaking ideas.

I extend my best wishes to the organizers, participants, and distinguished guests for a successful and enriching event.

Anandi Patel

(Ananadiben Patel)

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पत्र संख्या–28/पीएसओ–सीएम/2025

Yogi Adityanath

CHIEF MINISTER
UTTAR PRADESH

Lok Bhawan,
Lucknow - 226001

Date: 25 JAN 2025

Message

I am happy to know that GL Bajaj Group of Institutions, Mathura, Uttar Pradesh is organising an IEEE International Conference on 'Intelligent Control, Computing and Communications' on 13th & 14th February, 2025.

Conferences and Seminars assist the students in achieving knowledge and experience. It is essential that such programmes be organised regularly to promote academic excellence and expertise among the faculty members as well as the students.

I hope that this Conference will provide an appropriate platform to the participants to share and exchange their views and ideas on various aspects of 'Intelligent Control, Computing and Communications'.

My best wishes for the entire endeavour.

(Yogi Adityanath)

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CHAIRMAN'S MESSAGE

I am happy to announce that G L Bajaj Group of Institutions, Mathurawill be hosting an International Conference on Intelligent Control, Computing, and Communication (IC3-2025) on February 13-14, 2025. This conference will bring together esteemed scholars, researchers, scientists, and technocrats from around the world, providing a unique opportunity for intellectual exchange and collaboration.

The event will foster a dynamic environment for the sharing of cutting-edge ideas and the exploration of emerging technologies in the fields of intelligent control, computing, and communication. With experts from various countries coming together, we anticipate an inspiring atmosphere that will energize all participants, sparking new ideas and perspectives.

This confluence of global expertise will serve as a platform for meaningful discussions, offering fresh insights into the latest advancements and the transformative potential of these fields. The conference will challenge our thinking and inspire us to embrace innovation and push the boundaries of what is possible. It will also provide an invaluable opportunity for networking and forging collaborations that may lead to future research breakthroughs and technological advancements.

I encourage all attendees to actively engage in the sessions and discussions, as the knowledge shared here will undoubtedly influence the future directions of research and development. I am confident that the ideas exchanged during this event will inspire us all to strive for excellence and contribute to the advancement of technology in meaningful ways.

As we look ahead, I hope that IC3-2025 will serve as a catalyst for new discoveries, collaborations, and innovations.

Wishing all participants, a rewarding and fruitful experience at the conference, and a successful year ahead.

Dr. R K Agrawal
Chairman

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VICE CHAIRMAN'S MESSAGE

I am pleased to announce that G L Bajaj Group of Institutions, Mathura, will be hosting its inaugural International Conference on Intelligent Control, Computing and Communication (IC3-2025) on February 13-14, 2025.

As the Vice-Chairman of the Institute, I wholeheartedly support this initiative and look forward to the success of the conference. This event brings together researchers, academicians and students to foster innovation and explore groundbreaking advancements in these rapidly evolving fields. Focusing on emerging technologies and their transformative impact, the conference will provide a platform for collaboration and inspire fresh avenues of research. Our goal is to shape the future of computing and all engineering disciplines.

I extend my best wishes to all participants for an enriching learning experience and a productive exchange of ideas.

Pankaj Agrawal
Vice Chairman

Prof. Durg Singh Chauhan
Pro-Chancellor
Former President, Association of Indian University (AIU) New Delhi
Former Member Board of Governors, Doon School
Former VC, UPTU, Lucknow, & UTU Dehradoon
Former VC, LPU, Punjab & J.P. University, IT (HP)
Former Member, University Grant Commission, NBA (AICTE), NABL (DST)

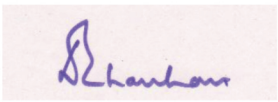
Message

I am delighted to know that G L Bajaj Group of Institutions, Mathura is organizing IEEE International Conference on **Intelligent Control Computing and Communications (IC3-2025)** on 13-14 February, 2025. I am pleased to write this message which will be included in the Conference Souvenir of the conference.

The topics to be covered in this International Conference are comprehensive and will add knowledge for the scientific community in embracing innovation and exploring cutting-edge developments in these dynamic fields. It will serve as a milestone for developing and understanding about new technological developments and emerging trends in this area.

I hope the goal of the conference is to update the knowledge of teachers, young researchers, research scholars and PG students. I shall be glad to receive a path forward drawn from the conference.

I congratulate the organizers for taking this initiative and extend my best wishes for the successful conduction of event.



Prof. (Dr.) D.S. Chauhan

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Dear Colleagues,

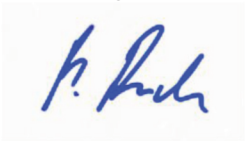
it is with pleasure that I have accepted this invitation to join you all in Mathura, India for the 2025 International Conference in Intelligent Control, Computing and Communications. Two key aspects make it important for me to be at this conference.

First, this topic is extremely important for science, for industry and for society. We see entire societies and economies struggling with the impact of AI, modern communication systems, social media, and the ever-growing power of computing systems.

Second, a conference like this emphasizes the need of scientists across the world to work together. It is this culture of science, to exchange and discuss ideas, that helps us making the world a better place for all. Cutting off these communications will make our world worse and will be a road block for further progress.

So, I wish us all open and exciting discussions with new ideas being developed and new connections between people, countries, and scientific fields being established here in Mathura in the coming days

Yours truly



Prof. Dr.-Ing. Michael M. Resch
Prof. e.h. (RAS) Dr. h.c. (RAS) Dr. h.c. (DonNTU)

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DIRECTOR'S MESSAGE

With great pride and enthusiasm, we welcome all distinguished guests, academicians, researchers, and industry professionals to the International Conference on Intelligent Control, Computing, and Communications (IC3-2025), organized by GL Bajaj Group of Institutions, Mathura.

In an era driven by technological advancements and digital transformation, this conference serves as a dynamic platform for intellectual exchange, fostering innovation and collaboration in AI, intelligent control systems, computing, and next-generation communication technologies. It brings together leading minds from academia and industry to discuss breakthroughs that shape the future of science and engineering.

We are glad to have Prof (Dr) D S Chauhan, Ex. Vice-Chancellor, UPTU, Lucknow, as the Chief Guest, and Prof. (Dr) Michael M. Resch, Director, HLRS Lab, Stuttgart, Germany, as the Guest of Honor.

IC3-2025 proudly hosts a panel of eminent speakers, including Prof. Bob Coecke (University of Oxford, UK), Prof Simon See (NVIDIA AI Technology Center, Hong Kong), Prof Rajkumar Roy (City University, London, UK), Prof. Amlan Chakrabarti (University of Calcutta, India), Dr Ritajit Majumdar (IBM Quantum, India), and Dr Petra Soderling (France), among others. Their expertise will provide deep insights into cutting-edge research and industry applications.

Our sincere gratitude to the management, faculty, organizing committee, and participants, whose dedication and contributions have made IC3-2025 a reality. We hope this conference ignites new ideas, research collaborations, and pathways for technological innovation.

We welcome you all to GL Bajaj Group of Institutions, Mathura, and look forward to an intellectually stimulating and enriching experience.

Best Regards,

Prof Neeta Awasthy
General Chair IC3-2025
Director
GL Bajaj Group of Institutions,
Mathura (UP) INDIA

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CONFERENCE CHAIR'S MESSAGE

Dear Colleagues,

It is with great honor and immense pleasure that I welcome you to the International Conference on Intelligent Control, Computing and Communications (IC3-2025). This prestigious gathering of scholars, researchers, and industry experts is a testament to our shared commitment to advancing knowledge, fostering innovation, and strengthening global collaborations in the area of Quantum Computing,

IC3-2025 aims to serve as a dynamic platform for the exchange of groundbreaking ideas, pioneering research, and transformative technologies. The diverse range of keynote addresses, technical sessions, and networking opportunities will undoubtedly enrich our understanding and open new avenues for future research and industrial applications.

Organizing this conference has been a journey of dedication, teamwork, and perseverance. I extend my deepest gratitude to our esteemed speakers, paper presenters, reviewers, sponsors, and the entire organizing committee for their unwavering efforts in making IC3-2025 a resounding success. Special appreciation goes to our delegates and participants, whose enthusiasm and contributions drive the essence of this conference.

As we embark on this intellectual journey, I encourage you to engage, collaborate, and make lasting connections. May IC3-2025 inspire new ideas, spark meaningful discussions, and leave a lasting impact on your academic and professional pursuits.

Wishing you a productive, insightful, and memorable conference experience!

Prof V K Singh
Conference Chair (IC3-2025)

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TRACK-1

FROM QUANTUM IN PICTURE TO INTERPRETABLE AND SCALABLE QUANTUM AI

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Over some 20 years we have developed a compositional quantum formalism. We showed that this enabled secondary school students to perform exceptional on an Oxford University post-grad quantum exam. The same formalism has been used as the basis for a compositional interpretable formalism for NLP, and AI more generally. Recently, theoretically, we have demonstrated potential exponential quantum advantage, and experimentally, on Quantinuum's quantum hardware, compositional generalisation for training.

THE FUTURE OF HPC AND AI

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The world of computing has been hit by the AI wave. Both with respect to hardware and to usage, HPC centers are facing new challenges. This talk explores where we stand, what the driving forces are and how HPC and AI can be merged to help us come up with better solutions for our challenges. Examples will highlight the potential of such new solutions.

OPPORTUNITIES AND CHALLENGES IN DNA DATA STORAGE

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Storage has been a fundamental need for every life on the planet. For example, Ants store food and Humans store data. Life has chosen DNA to store the blueprint of life. Storage is also a basic computing primitive. Unless you store the data you cannot process it. The representation of information can give you a different format for data storage. Humans are storing data from a very ancient time. Modern Humans are generating data every day from digital media such as cameras, Internet, phone, sensors and there is a pressing need for a technology that can store this data in the dense storage medium. It is predicted that soon the data generated will be in the order of Geopbytes from the Internet of Things. At present to store such big data we need large space and also it is very costly. Synthetic data storage seems to be the right technology emerging on the horizon. In 2013, Scientists showed how to store data on synthetic DNA with storage capacity of 2.2 petabytes on one gram of DNA. One can store 455 exabytes of data in one gram of DNA. In the last 10 years many Codecs (error correcting codes) have been developed to achieve the limit. A new international consortium of DNA data storage (SNIA) alliance has been formed in 2021 to develop standards of the technology. Even a JPEG DNA codec is under development. Companies are now working on efficient DNA synthesis. New opportunities are emerging for researchers, engineers and business. This talk will give a brief overview of this new area including our recent work in this new emerging area of DNA based data storage and concludes with few challenges.

THE QUEST FOR QUANTUM/AI OPTIMIZED HPC WORKFLOW

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Quantum Computing may be the key to meet the explosion of energy/space/precision/complexity challenges of rapid AI & HPC development worldwide. As the emergence of ExaFLOPS Top500Systems like ORNL Frontier HPC cluster since June 2022, we apply our innovative fine-grained topology-aware software-hardware ATMapper (Algorithm-Topology Mapping) to improve benchmark performance toward ExaFLOPS system's peak performance. Due to application challenges in data movement, limited degree of parallelism, sparse matrix and/or irregular workflow, the sustained benchmark performance like HPCG can only reach ~1% of system peak performance (14PF/1685 PF), compared to world's best HPCG Benchmark of ~3% peak performance (16PF/537PF) by Riken Fugaku cluster since November 2022. Comparing two software-hardware graph-mapping approaches for workflow partitioning/assignment/scheduling in our previous 2021 DoE VFP project, we tested Dr. Butko's load-balanced LBNL TIGER mapper using D-Wave's Quantum/Simulated Annealer(QA), and our Dr. Shih's self-organizing load-imbalance ATMapper using AI A* search. We are optimistic about designing a better future Q/AI TIGER/ATMapper hybrid to help most any complex, irregular HPC applications finding the best topology-aware processor binding assignment/allocation (or application-custom network topology synthesis) given their computation workflow dependence constraints. Dr. Shih's ATMapper is a self-organizing load-imbalanced static workload assignment/scheduler, capable of an average 0.5 data hop on 90% of data movement (0 hop: reusing same processor node as possible, or 1 hop: transferring data if necessary to immediate neighbor node), comparing to the typical 3 hops data movement among switches on ORNL Frontier/Aurora Dragonfly topology enhanced by dynamic HPE Cray Slingshot Interconnect. The results of further comparing ATMapper with D-Wave balanced workload partition and SLURMscheduler will serve as a baseline for later improving standard SLURM scheduler performance using a QA-enhanced ATMapper approach.With QA's negligible cost/power/space requirement, QAI^HPC software-hardware co-design optimization is a green game-changer toward computation cost efficiency and sustainability for both HPC application users and data center providers.

SELF-ENGINEERING

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Long-life systems, such as aircraft, car, and train, often need continuous maintenance to discharge their functions. There is significant research on failures in high value, safety-critical, inaccessible, and productivity-critical long-life systems during its operation phase in the lifecycle. For long-life systems the operation phase is often around 60% of the lifecycle. Therefore, maintenance contributes significantly to the through-life cost. This keynote will introduce a concept of self-engineering that reduces the through-life cost and prolong life of the systems. Self-engineering utilises self-healing, self-repairing, self-cleaning, self-adapting and self-reconfiguration concepts to enable a system to respond autonomously to a loss or potential loss in its function. Biological inspirations are explored to better understand the features and complexities of self-engineered systems. The features are then used to design and build a self-cleaning system for effective automated cleaning of aheat exchanger (HX) fouled by brewing wort. The self-cleaning system uses temperature outputs in a digital twin (DT) simulation and a controller to identify when fouling occurs and trigger a cleaning response. Complexities of the system are represented by repeatability, redundancy and self-control. The study recommends ways to reduce the complexity while maintaining effective self-cleaning for the heat exchanger. The keynote will conclude with future research directions for the self-engineering.

THE ERA OF QUANTUM UTILITY AND BEYOND

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The rapid advancements in quantum computing have propelled us into a new era of quantum utility. This talk will explore the transformative potential of quantum computing as it moves from experimental laboratories to real-world applications.

QUANTUM COMPUTING: A REVOLUTION IN PROBLEM SOLVING

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Quantum supremacy demonstrates quantum computers' unparalleled capability by harnessing qubit states and the unique properties of quantum mechanics. Unlike classical bits, qubits exist in superposition, simultaneously representing multiple states, enabling the quantum state vector to describe complex probability distributions. Entanglement further connects qubits, allowing computations to scale exponentially. These quantum properties enable tasks like sampling quantum distributions or simulating quantum systems, which are infeasible for classical systems. Quantum supremacy underscores the revolutionary potential of quantum computing, reshaping how complex problems are solved across science and technology.

INNOVATIVE PARADIGMS IN PARALLEL COMPUTING: BRIDGING THEORY AND APPLICATION

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In an era defined by rapid technological advancements, the fields of computer science, electrical, and electronics engineering are witnessing unprecedented transformations. This keynote presentation will explore innovative paradigms in parallel computing, emphasizing their critical role in addressing contemporary challenges and unlocking new opportunities. By examining recent developments in benchmarking techniques, particularly in the context of Fast Fourier Transform (FFT) applications, we will highlight the importance of reproducibility and efficiency in high-performance computing. Attendees will gain insights into collaborative efforts that have shaped the landscape of parallel computing, fostering a culture of knowledge exchange and innovation. Join us as we delve into the future of computing, where collaboration and cutting-edge research converge to drive positive change in our rapidly evolving world.

QUANTUM COMPUTING: A REVOLUTION IN PROBLEM SOLVING

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Quantum supremacy demonstrates quantum computers' unparalleled capability by harnessing qubit states and the unique properties of quantum mechanics. Unlike classical bits, qubits exist in superposition, simultaneously representing multiple states, enabling the quantum state vector to describe complex probability distributions. Entanglement further connects qubits, allowing computations to scale exponentially. These quantum properties enable tasks like sampling quantum distributions or simulating quantum systems, which are infeasible for classical systems. Quantum supremacy underscores the revolutionary potential of quantum computing, reshaping how complex problems are solved across science and technology.
Solving graph problems with quantum computers

THE ROLE OF GOVERNMENT IN ADVANCING QUANTUM TECHNOLOGIES

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In line with the theme of this conference, “emerging technologies and their transformative potential”, quantum technologies fit the profile perfectly. Although a nascent industry, quantum mechanics will be celebrating its 100th anniversary in 2025. It was in 1925 when Austrian physicist Erwin Schrödinger formulated the Schrödinger equation, describing how the quantum state of a physical system changes over time. He also popularized quantum mechanics with his famous thought experiment that involves a cat and a box.
There’s been several milestones in maturing quantum technologies towards commercial applications throughout the last century, but a real, newly-found renaissance began in 2018 when both the U.S. Congress and the European Union accepted their respective Quantum Initiatives, associated with handsome budgets. Multiple countries have since followed suit. Indeed, the role of the taxpayer cannot be separated from the science or the commercialization of emerging technologies.

AN INTRODUCTION TO ACCELERATED QUANTUM COMPUTING

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Quantum Computing (QC) systems will augment high performance computing (HPC) by accelerating certain kind of tasks/kernels. To do algorithm research and build applications for future quantum advantage, a bridging technology is needed to enable dynamic workflows across disparate system architectures. NVIDIA CUDA-Q is an open-source platform for integrating and programming quantum processing units (QPUs), GPUs, and CPUs in one system. CUDA-Q enables GPU-accelerated system scalability and performance across heterogeneous QPU, CPU, GPU, and emulated quantum system elements. In this talk, presenter will introduce Accelerated Computing and Quantum Computing. In addition, the advantages of Accelerated Quantum Computing will also be demonstrated. In the talk, the challenges and seamless integration of HPC-QC using CUDA-Q will be discussed.

Paper ID- 13

S2E3: SUSTAINABLE, SECURE, ETHICAL, E-BRANDING AND E-ADVERTISING SYSTEM USING METAVERSE TECHNIQUES AND HYBRID CRYPTOGRAPHIC APPROACH

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The digital era that integrates branding and advertising with groundbreaking technological resources has brought new-fangled strategies designed to boost sustainability, security, and ethics in the virtual context. This paper describes how a Sustainable, Secure & Ethic e-branding and e-advertising System (S2E3) is engineered via metaverse technologies. In this regard, the proposed system will combine immersive metaverse environments to make consumers more involved with ethical guidelines hand in hand with sustainability. In this paper, we have proposed a framework which emphasizes on a hybrid cryptographic solution that provides these foundational guarantees for user data security and transaction integrity, which are critical components in counteracting the privacy risks existing in digital advertising

Paper ID- 22

INTEGRATING AI INTO SOFTWARE ENGINEERING: A CRITICAL REVIEW AND FUTURE DIRECTIONS

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The field of Artificial Intelligence (AI) has been witnessing a huge demand in the field of research, tools development, and applications of deployment. There are multiple software companies which are shifting their focus to developing AI systems, many are also deploying the AI paradigms to their current system. Correspondingly, the academic research community has also used AI paradigms to solve the traditional software engineering problems. AI has become very useful to the software engineering community. The paper also uses a survey of the most commonplace methods of using AI into the Software Engineering, that covers the methods for SE phases such as Requirements, Design, Development, Testing, Release, and Maintenance. The paper also aims in answering to the sufficient intelligence in the SE lifecycle, this evaluates the overlapping of the SE and AI domains, and challenge the current conventional wisdom of the state-of-the-art.

Paper ID- 28

IMPACT OF TECHNOLOGY ON URBAN RESIDENTS INVESTMENT IN BANK DEPOSITS AND MUTUAL FUNDS: A CASE STUDY OF UTTARAKHAND

CA Priti Sharma, Rupa Khanna, Shashank Awasthi, Manas Kumar Mishra, Rakesh Kumar, Ayushi Sharma

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Investment decisions are an essential dimension in financial planning that affects the financial security of people and, in the larger context, economic growth. Two of the more well-known investment routes in India are bank deposits and mutual funds. Bank deposits are seen traditionally as safe and stable, with fixed returns and capital protection. Mutual funds, on the other hand pool money from different investors to invest in diversified securities and offer an opportunity for higher returns but come with increased risk. Dehradun is the capital city of Uttarakhand, caught in the grip of rapid urbanization and economic growth. The urban middle class is increasing, and awareness about financial products is improving. There is a need to understand the investment behaviour of its urban residents. This study, therefore, looks into the preference of urban people in Dehradun towards bank deposits or mutual funds, seeking to understand the factors that drive their decisions and the demographic patterns that affect these decisions.

Paper ID- 30

POWER OF FINTECH IN THE FINANCIAL INCLUSION

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The influence of fintech on financial inclusion is examined in this article, with a particular emphasis on how it might help underserved populations—particularly those in developing countries—have greater access to financial services. The paper addresses the technologies driving the FinTech revolution as well as the role of FinTech in improving financial inclusion, emphasizing its potential to spur economic growth and lessen poverty. The study examines the factors that influence the adoption of fintech, such as customer preferences, internet access, and smartphone penetration, and it shows how these factors can help businesses reach underserved groups and provide financial services. The study outlines the difficulties faced by FinTech in advancing financial inclusion, such as restricted infrastructure, cybersecurity threats, and regulatory impediments, and also investigates solutions. The report emphasizes the importance of effective coordination among policymakers, regulators, and industry stakeholders, while highlighting the revolutionary potential of FinTech in fostering financial inclusion and economic growth. This study provides a thorough examination of FinTech's contribution to financial inclusion, presenting tactics and recommended practices for doing so.

VIRTUAL WHITEBOARD USING HAND GESTURES

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With the help of hand gestures, the study presents a novel virtual whiteboard system that improves user engagement. Users can operate the virtual whiteboard interface with ease. This was all possible due to the system's usage of computer vision technology, which interprets and reacts to dynamic hand movements. The suggested system allows users to draw, erase, and alter content on the virtual canvas without making physical contact by integrating depth-sensing cameras and gesture recognition algorithms. This creates a natural and immersive experience. Because it encourages a more flexible and dynamic atmosphere for collaboration, the gesture-based interface is especially well-suited for learning environments, corporate gatherings, and innovative ideation sessions. The study assesses the accuracy, responsiveness, and user satisfaction of the system, offering insights into its possible uses and resolving issues related to gesture-based interaction. Future advancements in human-computer interaction can benefit from this research, which also advances the development of virtual collaboration tools that are easy to use. According to a recent research with 200 participants, the new technology proved to be beneficial in supporting dynamic and interactive presentations as seen by the 35% increase in user satisfaction and the 28% improvement in knowledge retention.

Paper ID- 38

THE STUDY OF REGULATORY AND ETHICAL CHALLENGE IN THE ROAD OF SUSTAINABILITY OF AUTONOMOUS VEHICLE IN INDIA

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It is a huge transformation in the transportation system globally because of the development of autonomous vehicle (AVs). AVs are beneficial for the road safety, optimization of fuel efficiency and for reducing carbon emissions. However, every coin has two side so as AVs also face numerous regulatory and ethical Challenges which must be focused to unlock the full potential of these technologies. In this study we explore the critical regulatory frameworks and ethical dilemmas which effect the sustainable development of auto vehicles and there application especially in developing countries like India. This study also includes the sustainable technologies used in the formation of autonomous vehicles. It also explores the AI regulations in AVs and after that find out the limitations of AVs in India. This paper aims to explore these regulatory and ethical challenges in depth and investigate how they affect the sustainability of AVs. The study aims to identify key areas of improvement and propose possible regulatory and ethical frameworks to provide significant insights that may be valuable for policymakers, technologists, and other stakeholders engaged in creating a responsible and sustainable future for autonomous transportation.

Paper ID- 42

AN APPLICATION OF FINTECH IS REVOLUTIONARY IN INDIAN BANKING SECTOR: W.R.T. TO HDFC BANK

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The financial technology (Fintech) is reshaping the world banking landscape so on India is no exception of this. This study explores the revolutionary impact of these financial technology on banking sector of India especially focus on the leading private bank of India is Housing Development Finance Corporation (HDFC) bank. This paper is started with the introduction of Fintech in banking sector how these advanced technologies such as big data analytics, mobile banking, digital payments system has been taken place of traditional banking system of India. This paper also explores the rise of fintech in banking sector such as faster payment, financial inclusion, blockchain integration. Additionally, this paper delves into how HDFC bank got revolutionary impact of these technology on its system and improve their growth level and enhanced customer experienced. This study also includes the key innovations of fintech such as: Robo advisor, Digital lending, payments and Regtech. This transformation of technology not only improve the experience of customer even make good positions of Indian banks like HDFC at forefront of global banking innovation.

Paper ID- 54

A LIGHTWEIGHT NETWORK DEPLOYED ON ARM DEVICES FOR HAND GESTURE RECOGNITION

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Hand gestures are important in improving interactions with natural and intuitive interfaces with computers (HCIs). This article represents a specially designed bright neural network to recognize the gestures of the flat - based platform. The proposed model, implemented purely in software, is optimized for resource-constrained environments, making it suitable for real-time applications on low-power devices. The network processes input from infrared (IR) sensors to classify hand gestures with high accuracy while maintaining low computational complexity.Special attention is paid to minimizing the memory and processing requirements of the model without compromising recognition performance. The system is evaluated with a range of hand gestures and demonstrates its effectiveness in achieving fast and accurate gesture recognition even with limited hardware resources. The software solution provides a scalable approach for deploying gesture recognition systems on embedded and wearable devices, enabling seamless integration into a variety of HCI applications. After extensive testing, the system proved to be competitive in terms of performance and low power consumption. This work shows how lightweight, software-driven machine learning models can be used in practice in real-world applications such as robotics, assistive technology and home automation.

Paper ID- 55

IoT-ENABLED CARGO SHIPMENT MANAGEMENT: REAL-TIME TRACKING AND OPTIMIZATION IN GLOBAL LOGISTICS

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IoT-enabled Freight Management: Real-time Tracking and Optimization in Global Logistics The integration of the Internet of Things (IoT) into Freight Management is revolutionizing the global logistics industry by improving real-time visibility, operational efficiency, and supply chain optimization. This paper explores the architecture and applications of IoT technology in freight logistics, focusing on real-time tracking, predictive analytics, and multimodal transportation optimization. By integrating sensors, RFID tags, GPS modules, and wireless networks into containers and vehicles, companies gain comprehensive visibility into shipments across different modes of transportation. The proposed framework leverages IoT data for intelligent decision making and predictive maintenance, minimizing delays and improving route efficiency through dynamic adjustments. This paper also addresses the challenges of data security, interoperability, and scalability when deploying IoT solutions in complex global supply chains. Furthermore, it presents strategies to overcome these obstacles by implementing secure communication protocols, cloud-based data management, and blockchain technology to improve transparency and traceability. Our results indicate that IoT-based logistics not only reduces costs through optimized resource utilization but also improves customer satisfaction by providing accurate delivery tracking and real-time status updates. The study concludes with future research directions, emphasizing the need for more flexible and adaptive logistics frameworks to address the volatility of global trade and the growing need for sustainable logistics practices.

Paper ID- 64

UPDATED MODEL DEEP LEARNING METHODS FOR CLASSIFICATION OF RESPIRATORY DISEASES USING DIFFERENT MEDICAL IMAGING AND COUGH SOUNDS

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pathogenic, it is necessary to identify infected people for quarantine and treatment. The use of artificial intelligence and deep learning approaches can lead to prevention and reduction of treatment costs. The purpose of this study is to create deep learning models in order to diagnose people with the respiratory disease through the sound of coughing.
Background: This study aimed to propose an automatic prediction of respiratory disease like Cough using cough sound based on deep learning models algorithms.
Result: With the data here it is collected (about 254 people) in different networks, we have reached acceptable accuracies.

Paper ID- 95

BITS TO QUBITS: AN OVERVIEW OF QUANTUM COMPUTING

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The advent of computers has significantly diminished the need for manual computation. As technology has evolved, it has led to the creation of classical computers with high performance, throughput, and memory capacity. Classical computers store data in binary format, using bits that can either be 0 or 1, typically represented by low and high voltage levels, respectively. While effective, this method sometimes demands considerable resources for certain computations. In contrast, quantum computers represent the cutting edge of computing technology. They utilize quantum bits or qubits, which exploit quantum mechanical phenomena like superposition and entanglement, allowing for more efficient problem-solving. This paper presents a simplified overview of the core concepts of quantum computing.

Paper ID- 98

A FRAMEWORK FOR IDENTIFYING INFLUENTIAL SPREADERS OF DRUG USE IN ONLINE SOCIAL NETWORKS

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Online social networks have become key platforms for spreading drug-related content, which presents a risk to the public, especially for people who are more susceptible to drug use and addiction. Generating vast amounts of data, such networks offer valuable insights for computational analysis. In this paper, we introduce a new framework to identify influential spreaders who use social networks to promote drug-related content. It does so by means of influence maximization (IM) algorithms; in particular, it uses an approach called 'label neighbor-based selection of seed nodes (LNSSN)'. It also proposes new metrics for the percentages of types of users affected, comprehensively assessing each algorithm's effectiveness across different network types and combinations of scenarios. This framework is designed to assist governments, technology companies, and law enforcement agencies in prioritizing and addressing sources of drug-related content on social networks.

Paper ID- 105

ADVANCES IN TYPE-2 DIABETES PREDICTION: A COMPREHENSIVE REVIEW OF MACHINE LEARNING TECHNIQUES

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Type-2 diabetes mellitus, on the other hand has been regarded as one of the growing concerns globally and thus clearly raises the need for making accurate forecasts of diabetes. The risk for Type-2 diabetes can be predicted using Ma-chine Learning as well as any other form to make the predictions much more enhanced than the traditional methods. This paper aims to give a broad overview of literature that has so far been available on the ML algorithms used in the management of type-2 diabetes including such supervised algorithms as logistic regression, alphabet regression, random forest, support vector regression along with other methods such as, ensemble learning, deep learning, and hybrid. Analysis of the main aspects for the performance model such as parameter selection, the way to face and cope with imbalance parameters, interpretability and generalizability across different populations, another aspect that was regarded is the possibility of using real-time data collected with wearable devices and applying tissue and other biomarkers for better prediction. Finally, the key obstacles and future directions towards developing ML algorithms and models explainable and clinically relevant have been introduced to help researchers and practitioners toward effective, personalized, and scalable interventions.

Paper ID- 207

EFFICIENT DEEPFAKE DETECTION USING CONVOLUTIONAL NEURAL NETWORK

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In recent times, generative AI has advanced quickly, and generative adversarial network (GAN) has been used to create realistic-looking fake multi media. It is still quite difficult to identify these artificial intelligence (AI)-generated fake photos. Therefore, the proliferation of fake media incites fear in social groups and can harm a person's or community's reputation by influencing public attitudes and perceptions about them. The convolution neural network (CNN) is a useful weapon for combating deepfakes. While the majority of approaches use image datasets with a small number of images and pre-trained models to demonstrate the fake detection accuracy, this paper presents an efficient CNN architecture, which is trained and tested on a balanced dataset of over 1,40,000 images namely 140k Real and Fake Faces dataset available on Kaggle, comprising 1,00,000 training images and 40,000 test and validation images combined. The proposed CNN model's learning rate is increased by applying an adam optimizer and sparse-categorical cross entropy. With a validation accuracy of 95.40%, a testing accuracy of 95.18% and an Area Under Curve (AUC) score of 0.98, the specially trained CNN model establishes a new standard for the identification and categorization of deepfake images.

Paper ID- 210

EXPLORING THE POTENTIAL OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING IN FOG COMPUTING, CLOUD COMPUTING AND EDGE COMPUTING: BENEFITS AND CHALLENGES

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The fusion of Artificial Intelligence (AI) and Machine Learning (ML) with distributed computing frameworks such as Fog Computing, Cloud Computing, and Edge Computing is vital for shaping the future of digital technology. "This review paper delves into the interplay between AI/ML and these distributed computing paradigms, exploring their fundamental concepts and structures. It examines how AI/ML technologies are integrated into these frameworks, resulting in improved resource management, enhanced data processing capabilities, and more intelligent decision-making at the network edges. The paper highlights real-world examples from various industries, including healthcare, finance, IoT, and Industry 4.0, showcasing the innovative breakthroughs driven by these technologies. However, it also acknowledges the challenges that need to be addressed, such as ethical concerns, security and privacy issues, and the need for standardized frameworks. The paper provides guidance for researchers, professionals, and policymakers to harness the synergies between these technologies, paving the way for a more efficient and intelligent computing landscape in the digital era.

Paper ID- 211

RESOURCE ALLOCATION STRATEGIES FOR EDGE AND FOG COMPUTING IN THE CLOUD CONTINUUM

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The advent of edge and fog computing has revolutionized the traditional cloud computing landscape by enabling data processing closer to the data source. This paradigm shift addresses limitations such as high latency and bandwidth consumption inherent in centralized cloud models. Effective resource allocation in this context is crucial for optimizing performance and ensuring efficient operation across the cloud continuum, which integrates cloud, fog, and edge computing layers. This paper provides a comprehensive review of current resource allocation strategies employed in edge and fog computing, including heuristic-based methods, machine learning approaches, game theory, auction mechanisms, and Quality of Service (QoS)-aware techniques. Each method's strengths and weaknesses are analysed, highlighting the challenges of complexity, scalability, data requirements, and adaptability. Additionally, this review identifies future research directions that promise to enhance resource allocation efficiency. Key areas of focus include the integration of advanced artificial intelligence and edge intelligence, the use of federated learning for collaborative resource optimization, the application of blockchain technology for secure and transparent resource management, and the development of energy-efficient allocation strategies. The potential of hybrid approaches that combine multiple resource allocation strategies is also explored. By addressing these challenges and leveraging emerging technologies, future research can significantly improve resource allocation in the cloud continuum, ensuring robust, scalable, and efficient computing environments capable of meeting the demands of diverse and dynamic applications. This review aims to guide researchers and practitioners in developing innovative solutions for resource allocation in edge and fog computing, driving the evolution of the cloud continuum.

Paper ID- 218

PREDICTIVE CARDIOVASCULAR HEALTH ASSESSMENT WITH FLASK AND MACHINE LEARNING MODELS

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Cardiovascular Health Forecaster Employing Flask is a cutting-edge online application that combines Python for its backend and Flask for its frontend. It anticipates heart disease risk with a smooth integration of Flask for data input and Python for machine learning, making it perfect for both users and healthcare professionals. As heart attacks take one life every minute, prediction automation becomes essential. Information science handles large amounts of data in healthcare, tackling the difficulty of predicting coronary heart disease. making use of a dataset on cardiac illness from the UCI AI repository. The AI algorithms—Light GBM, AdaBoost, Gradient Boosting, XG Boost, and Random Forests—are used in this study to predict and classify the risk of cardiovascular illness. The study shows Light GBM's remarkable 90% accuracy, making it a relative report on algorithm performance.

Paper ID- 219

EMOTION DECODING OF SPEECH USING NLP ANALYSIS APPROACH

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Emotion decoding of speech using NLP provides an integrated solution for emotion-driven applications. This project creates a comprehensive system for speech-to-text conversion, sentiment analysis, transcription accuracy evaluation, and senti- ment visualization. The system converts spoken audio into text using the Speech Recognition library and the Google Web Speech API. To ensure reliability, transcription accuracy is assessed using the Levenshtein distance algorithm, which calculates the smallest number of edits necessary to determine the similarity between the transcribed text and the reference text. VADER (Valence Aware Dictionary and Sentiment Reasoner) from the NLTK library is used by the system for emotion analysis. It is a potent tool for assessing sentiment intensity and assigning sentiment scores to associated emotional states like positive, negative, or neutral. Actionable insights into the speech's emotional content are offered by this analysis. The system creates pie charts using Matplotlib to show sentiment distribution in order to improve interpretability. Users can quickly and naturally understand the emotion landscape thanks to this functionality. This system is well-suited for real-world uses like psychological analysis, where emotional states offer vital diagnostic information, and customer service, where comprehending client emotions is essential. It does this by integrating speech processing, transcription evaluation, sentiment analysis, and visualization into a coherent framework.

Paper ID- 224

CASE STUDY ON THE EFFECTIVENESS OF FEATURE ENGINEERING FOR THE PERFORMANCE IMPROVEMENT OF DATA MINING APPLICATIONS

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In this paper we try to demonstrate the effectiveness of different techniques for feature selection and optimization strategies that are used for data mining applications. Feature extraction is an important step in every data mining application, which aims to find discriminative patterns, interconnection, and structures within large datasets. In this paper we try to illustrate the effective use of the classical methods such as Principal Component Analysis (PCA), Kernel principal component analysis (KPCA), as well as more innovatory methods to better represent the data so as to achieve a better performance of the underlying pattern analysis, datamining tasks. We also consider effective representation of the data items in a discriminative way. We demonstrate this by making use of synthetic data so that a visual analysis can be made. We also use 3 real world datasets to demonstrate the effectiveness of PCA and KPCA based representations for obtaining improved performance for an SVM based multi-class classifier

Paper ID- 230

GENERATIVE AI IN REAL-TIME E-COMMERCE FRAUD DETECTION: A COMPARATIVE AND ETHICAL ANALYSIS

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This research investigates the use of generative artificial intelligence models—specifically Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs), and hybrid GAN-VAE models—in enhancing real-time fraud detection in e-commerce. Our experiments demonstrate that GANs effectively generate synthetic fraud data, while VAEs excel in anomaly detection, capturing diverse fraudulent patterns. The hybrid model combines the strengths of both, yielding optimal accuracy and adaptability. We also address ethical concerns, including bias mitigation and data privacy, to ensure responsible implementation. This study highlights the potential of generative AI to significantly improve fraud detection frameworks in the evolving e-commerce landscape.

Paper ID- 300

INVESTIGATING COMPUTATIONAL BOTTLENECKS IN MRI PRE-PROCESSING PIPELINES

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MRI pre-processing is essential for neuroimaging analysis, yet its computational demands present significant challenges, particularly in large-scale studies and certain clinical applications. Although High-Performance Computing (HPC) and Deep Learning methods have been employed to mitigate these challenges, they are often inaccessible due to high costs and hardware requirements. This study aims to identify and understand the primary performance bottlenecks in MRI preprocessing pipelines to enhance their efficiency. Using the Intel VTune profiler, we analyzed commonly used pipelines from the ANTs, FSL, and FreeSurfer toolboxes. Our findings reveal that a small number of functions dominate CPU usage, with linear interpolation being the most significant contributor. We also observed considerable performance impacts due to data access inefficiencies. Additionally, a bug in the ITK library affecting the ANTs pipeline's single-precision mode and potential issues with OpenMP scaling in FreeSurfer's recon-all were identified. These insights offer a foundation for optimizing MRI pre-processing pipelines in future research.

Paper ID- 310

BIG DATA INFRASTRUCTURES USING APACHE STORM FOR REAL-TIME DATA PROCESSING

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Apache Storm-based Big Data infrastructures strive to provide a scalable and fault-tolerant platform that will transform real-time data processing. The goal is to use Apache Storm's features to handle and analyze massive amounts of data in real-time, guaranteeing correct insights that are delivered promptly. The objective is to provide a solid foundation that can manage data moving at high speeds from many sources, allowing for analytics in real-time and continuous computing. The goal is to maximize throughput while reducing delay via architectural optimization and efficient data flow methods. The goal is to improve Apache Storm's capabilities and make sure data processes smoothly across dispersed systems by combining it with other big data technologies. The end goal is a robust system that can provide analytics on data in real-time, which will aid in decision-making across several industries, including banking, telecoms, and social media. Efficiency, scalability, and dependability in managing massive data streams are key considerations. The data flow topology dataset for 5 distinct components and 5 streams shows throughput values ranging from 2500 to 4100 tuples per second. Similarly, the fault tolerance and reliability dataset for 5 distinct nodes and 5 different intervals shows throughput values ranging from 700 to 1050 tuples per second. All these results are derived from real-time sensor data used for traffic monitoring.

Paper ID- 323

OPTIMIZING SHORTEST PATHS IN BIG DATA USING THE FLOYD-WARSHALL ALGORITHM

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Improving the efficacy and precision of route computations in massive datasets is the goal of optimizing big data shortest routes using the Floyd-Warshall algorithm. Optimal route planning, network optimization, and urban mobility solutions may be achieved by using the algorithm's capability to calculate shortest routes between all pairs of vertices in a graph. Creating a solid foundation that can analyze large amounts of data and provide trustworthy outcomes for decision-making is the main objective. In addressing these challenges, concerns related to scalability, slow convergence rates, and potential errors in route calculations need resolution. The objective is to improve the efficiency and decision-making abilities of intricate systems by adjusting the Floyd-Warshall algorithm for extensive data environments. This will lead to a scalable and efficient solution that can be used in transportation, network routing, and urban planning, among other areas. In one example, the intermediate matrix displays the nodes from A to D, while in the other, the results from the road network show the initial adjacency matrix, where the distances between points A and D vary from 10 to 35 kilometers. In the final matrix, for the nodes A–D, the distance in kilometers varies from 10-35 for the shortest distance traveled; in the same data set, this range is 10–40.

Paper ID- 328

INTERVIEWIQ AI-POWERED CHATBOT FOR UPSKILLING CANDIDATES IN TECHNICAL AND HR INTERVIEWS

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The job security one wants is very difficult to get as job seekers often struggle in technical and HR interviews owing to lack of proper preparation and even minimal feedback. Platforms are abundant on aptitude and coding tests, which forget realistic interview simulations. To overcome the gap, InterviewIQ uses AI-powered mock interviews mimicking real-life technical and HR interactions. NLP powers the questions on this platform to be dynamic in relation to the candidate's answers. For every session, feedback is provided about the candidate's technical skills, communication, and sentiment that was there during the interaction, allowing them to learn and realize their strengths and areas for improvement. Offering a chance for personal practice, and also actionable insights for InterviewIQ, enables them to be better prepared and give higher chances in actual interviews.

Paper ID- 332

OPTIMIZED MULTITASK SCHEDULING IN CLOUD COMPUTING USING ADVANCED MACHINE LEARNING TECHNIQUES

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The delivery of computing services over the internet is known as cloud computing. One of most important problem in the cloud computing environment task scheduling, which has a direct affect on the platform's overall performance. Tasks are scheduled for specific resources at specific times based on user requests. It mainly focuses maximize resource utilization, minimize makespan. Task scheduling in cloud is still a problem even if there are several ways to improve it. One important step in effectively harnessing cloud computing's potential is scheduling tasks efficiently. In this work, machine learning technique is presented for improved multitask scheduling in cloud computing. For efficient task scheduling, we propose ML feature-based heuristic task scheduling (MLF-H). Instead of randomly assigning a scheduling algorithm, ML techniques are used to incoming task requests to classify best suitable algorithm for task. Simulation results show that MLF-H task scheduling approach has shortest makepan and rapid generalization capabilities when compared to traditional methods. This proves the availability of the approach and the efficiency of the MLF-H scheduling algorithm.

Paper ID- 345

DEEP LEARNING ENABLED GARBAGE CLASSIFICATION AND ANALYSIS

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Challenge faced by most cities worldwide. One of the key aspects of waste management is garbage prediction, which involves sorting waste into different categories for efficient disposal or recycling. Garbage prediction is an important task in waste management, with the goal of reducing environmental pollution and promoting sustainable practices. Developing countries such as India, where the growing population and increasing amount of waste have become major concerns. Currently, the existing garbage management practices involve the collection of domestic and industrial waste and dumping it in large yards, where laborers manually sort through it, which can be a time- consuming and inefficient process. However, with the development of smart cities across India, the implementation of a Smart Garbage Management system is crucial. This paper explores the application of machine learning algorithm in garbage classification and presents a garbage classification system based on convolutional neural networks (CNNs), to classify images of waste and sort them into different categories. By using this garbage classification system, the physical labor required for waste segregation could be reduced, and the accuracy of sorting waste could be improved. Ultimately, implementing such a system would help in efficient waste management.

Paper ID- 349

DEEP LEARNING-BASED OBJECT RECOGNITION IN AR-VR ENVIRONMENT

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Artificial intelligence (AI), AR-VR (Augmented Reality and Virtual Reality) have recently made significant strides, paving the way for innovation and change in a wide range of fields and industries. The quick advancements in AR-VR and computer vision (CV) made it easier to comprehend and analyze the surroundings. In this study, works that combined augmented, virtual reality (AR-VR) and deep learning for object recognition throughout the recent years are thoroughly reviewed and presented. The three primary focuses of this paper are: 1) List out the object identification techniques used in AR - VR in detail, 2) Describe the techniques, tools, and frameworks that are being utilized to create various types of AR-VR object detection, 3) Discussing object detection in AR-VR in detail and 4) Concluding the problems and identifying possible study fields in the AR-VR environment.

Paper ID- 351

DEEP LEARNING-BASED SIGN LANGUAGE RECOGNITION: A COMPREHENSIVE ANALYSIS

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In an increasingly interconnected world, fostering inclusivity is important, especially for individuals with disabilities. For the deaf and hard-of-hearing community, sign language is a vital communication medium. However, a significant communication barrier arises when sign language users interact with those unfamiliar with it. This results in them having barriers to education, services, and social engagement. This study introduces a real time translation system leveraging multiple ML and Deep Learning algorithms to convert live sign language gestures into grammatically coherent English sentences unlike existing systems that focus on isolated gestures or letters, our approach captures word-level and sentence-level nuances. For this goal currently we leveraged well renowned American Sign Language (ASL) dataset to train our models. A stop signal gesture enables users to indicate the end of a sentence, thus ensuring seamless, fluid communication. By modelling spatial and temporal visual patterns in video datasets, the system aspires to redefine accessibility, empowering the deaf and hard-of-hearing community to communicate more effectively and independently.

Paper ID- 354

HYGIENE GUARDIAN : PROXIMITY – ACTIVATED SANITIZING DUSTBIN WITH AI VISION

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Intelligent, automated waste disposal systems are more important than ever because of the growing public health issues in metropolitan areas and the potential for disease transmission from poorly managed garbage. The Hygiene Guardian combines IoT and image recognition technology to present an intelligent waste management solution. The AI model that detects humans is trained and deployed using Edge Impulse, a potent machine learning platform at the heart of the system. The dustbin's lid opens automatically when a human is recognized, allowing for non-contact disposal. This innovation lowers the behavioural and health hazards related to animal involvement while also improving hygiene by preventing animals from reaching the bin. An automated sanitation mechanism that uses a pump motor to spray disinfectant after each use is included in the system to further reduce health hazards. This sterilization procedure helps to create a safer, more hygienic waste management system by minimizing the accumulation of dangerous germs and viruses in high-traffic areas where manual cleaning is frequently insufficient or impracticable. By using these technologies, the Hygiene Guardian seeks to improve environmental cleanliness and public sanitation practices, particularly in crowded places, hence lowering the risk of disease transmission. In order to guarantee cleaner, healthier surroundings, this creative approach to garbage disposal shows how AI and IoT can be used to address practical urban hygiene problems. It provides a scalable solution that can be applied in a variety of public and private settings.

Paper ID- 360

MULTIMODAL COMPUTATIONAL FRAMEWORK FOR ASSESSING SDG CONTRIBUTIONS

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In recent years, sustainable development goals (SDGs) have gained significant attention as a global framework to address various economic, social, and environmental challenges. Achieving these goals requires accurate assessment and measurement of progress. With the rise of machine learning (ML) and artificial intelligence (AI), new opportunities have emerged to evaluate SDG contribution targets of corporate entities using advanced models. This paper investigates the potential of ML and AI for assessing contributions to targets for achieving different sustainable development goals.

Paper ID- 379

DEEP LEARNING FRAMEWORK BASED ON GENERATIVE AI FOR MEDICAL IMAGE ANALYSIS

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The use of Generative AI algorithms to enhance and facilitate medical diagnosis and treatment is a promising area, particularly for assisting clinicians' substantially. In order for the AI/ML algorithms to learn a certain task, large amount of data needs to be available. Data sets for medical image analysis are very complex to analyze

unlike the natural images, are relatively of poor quality due to several image acquisition artefacts, and rarely public due to privacy restrictions concerning the sharing of patient data. The production of high quality substitute/synthetic images can come to the rescue, with a potential to generate better quality images, without any noisy artefacts, does not have any privacy concerns, and can be easy to distribute publicly. A novel computational framework is proposed in this paper based on new deep learning architectures for generating synthetic or substitute medical images, for different downstream tasks such as classification and segmentation, that require extensive processing of radiology images from multiple modalities, particularly for diagnosis, tracking and treatment of complex diseases in the radiation oncology domain.

Paper ID- 463

FORECASTING TAX REVENUE WITH MACHINE LEARNING AND GRANGER CAUSALITY

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This paper aims to examine tax elements of various sorts making the government of Nigeria to have a collection basket. The main purpose of this work is to look at how taxes provide an adequate revenue mechanism, and what implications that has for fiscal policy and macroeconomic stability. To do this, FIRS (Federal Inland Revenue Service) information on various tax components was collected every month for the period 2010 to 2021. Our final model that was the best predictor of revenue was chosen after weighing three models: multivariate long short-term memory networks (MLSTM), seasonal autoregressive integrated moving average (SARIMA) and multivariate linear regression (MLR). Each model was rated on predicted value and accuracy. This multiple independence of prediction factor was considered in the study. Granger Casual relationship between the Dependent and Independent was conducted for hypothesis testing. With increasing numbers of independent variables, MLSTM and MLR models were better than one another. An achievement of R2 value of 99% were obtained by MLSTM model. In combination with these findings, it can be said that the MLSTM model can be used to forecast tax revenue with very high accuracy.

Paper ID- 491

SOLVING DIFFERENTIAL EQUATIONS WITH ADVANCED ALGORITHMIC TECHNIQUES

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One big change that has happened in differential equations is the use of new computer methods to solve hard problems. The growth of differential equations has been helped by this effect. If these strategies hadn't been used during the process, there would have been no change at all. In this abstract, neural networks and adaptive differential equation solvers are used together. This is one of the new ideas being looked into within the limits of this abstract. You can't use any other way to solve this type of dynamic net ODE. There isn't any other good answer. For people who want to understand how the process works, this outline also includes a description of the method. The goal of this study is to show that the suggested plan is better than other methods by looking at six different ways. The point of this study is to show why the suggested approach is better. The similarity that was just shown is one example of how speed has gotten better.

Paper ID- 499

THE INTERSECTION OF ALGORITHMS, AUTOMATA THEORY, AND FORMAL LANGUAGES IN COMPUTATIONAL THEORY

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Initially, the FLAGS methodology and a concise study schedule are presented. Combining automata and formal grammars, FLAGS has revolutionized computational theory. SAA, GSTA, and GAGD comprise the last three numerals of FLAGS. They exhibit greater adaptability, productivity, and the generation of novel ideas more frequently when they collaborate. GSTA guides the development of the automaton's real-time state through the use of formal language grammars. This results in a comprehensive and precise computational model. Official language signals are appended to the robot's orthography by the SAA. Text can be represented by flags in an extensive variety of arrangements. In order for FLAGS to function in computer and innovative language environments, AGDE modifies formal language standards to accommodate computer requirements. FLAGS is more innovative, adaptable, and practicable than six well-known approaches, according to the study's findings. Values of the Language Harmony Index (LHI) may be utilized to assess the productivity of FLAGs. It evaluates the compatibility and performance of various linguistic forms when combined. The abstract emphasizes the influence of FLAGS on computational theory. Through the integration of structured languages, computer science, and automata theory, this one-of-a-kind method produces results. This approach revolutionizes linked learning due to its computer-friendly nature and utilization of the target language

Paper ID- 522

ADAPTIVE EMOTION RECOGNITION FRAMEWORK LEVERAGING LIGHTWEIGHT CONVOLUTIONAL NETWORKS AND FUZZY LOGIC FOR ENHANCED INTERPRETABILITY AND EFFICIENCY IN LOW-RESOURCE ENVIRONMENTS

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This work presents a light-weight CNN based emotion recognition system which employs a fuzzy interface system for improving the facial expression recognition process. The envisioned framework uses CNNs for objective input features capturing critical facial characteristics expressing emotions and the fuzzy system to remove any fuzziness in the visual cues and improve classification accuracy. This dual approach increases the reliability of the emotion detection in contrast to other approaches that are often used where fine differences in facial expressions are required to be noted. Originally developed for environments with limited computational capabilities the system can be seamlessly run on low end hardware which places it in the sphere of application in healthcare diagnostics, human-robot interaction and adaptive educational technology. Employing the FER+ and JAFFE datasets for learning the model, the introduced system exhibits considerable efficacy in identifying prominent emotions for the various subjects. Combined with OpenCV, TensorFlow Lite, and skfuzzy libraries, this method lays a basic framework for large-scale real-time Emotion Recognition System in smart applications.

Paper ID- 524

A HYBRID SWARM INTELLIGENCE MODEL FOR EFFICIENT QUERY OPTIMIZATION IN DISTRIBUTED DATABASES USING GENETIC AND ANT COLONY ALGORITHMS

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Optimisation of queries in distributed databases is more imperative to enhance the processing rate and use of resources with limited computational abilities. This work presents a novel GA–ACO hybrid swarm intelligence model to address the query optimization problem. The optimization effort of the proposed model starts with GA for an initial population of probable paths for query execution which uses the concept of evolution to select diverse solutions. After that, ACO strengthens this set by the application of pheromone-based reinforcement that allows adjusting of a query paths toward the best solution or its approximation with the following number values. In this way the enhancement of the convergence rates and the scalability of the proposed solution when distributed databases are used can be explained. The model was tested with artificial query logs with DEAP being used for the implementation of the genetic algorithm while ant colony operations were implemented using Python built ACO libraries. Performance analysis shows the success of the developed model in decreasing query response time as follows: This essentially complex hybrid mechanism shows potential for future use in other areas with large data sets and efficient query handling.

Paper ID- 527

DYNAMIC KNOWLEDGE GRAPH CONSTRUCTION FOR REAL-TIME NATURAL LANGUAGE UNDERSTANDING IN AUTONOMOUS SYSTEMS

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This work presents Real-Time Semantic Mapping (RTSM), a new idea for improving the language comprehension in autonomous systems using the knowledge graph. RTSM solely relies on ConceptNet as its dataset and incorporate Spacy to parse and synchronize commends and signals from natural language appropriately. However, through the continuous updating of the knowledge graph, RTSM allows an autonomous system to provide accurate responding to real-time contextual changes with relatively low computational cost. Constant learning and semantic enhancement in this model make RTSM light and easily scalable, putting it at a higher ground as a natural language processing technique for use in autonomous systems. Due to a simple framework that makes it easy to incorporate all the knowledge, the RTSM is ideal in environments that are challenged for time and resources, but need to provide real time interaction capabilities.

Paper ID- 530

OPTIMIZING BATTERY PERFORMANCE IN ELECTRIC VEHICLES THROUGH PREDICTIVE MODELING

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The fast-paced electrification of the automobile sector has intensified an immediate need for reliable battery management systems capable of sustaining long-term performance. One of the most important indicators when

it comes to battery health is State of Health (SOH), which indicates how much capacity is left and how long a certain battery will endure. Reliable estimation of SOH is critical to enable the optimal performance of vehicles, reduce service costs, avoid unanticipated failures. In this project, we propose a machine learning approach to predict the SOH of EV batteries based on the two widely used algorithms, XGBoost and LGBM. In order to cover and analyze as many process variables available as possible to build a database for the training and evaluation of the models, we measured multiple battery parameters, such as voltage, current, temperature and historical charge/discharge cycles. The train test split this dataset in such a way that the greater part of the dataset is used for the machine learning operations. Individual models, such as XGBoost and LGBM, are used to be train due to its strength in handling large data and complex data with a high precision. This study attempts to find out the better of the two algorithms for real-time SOH prediction in practice by analyzing the accuracy and performance metrics of both algorithms. Results of this analysis can help manufacturers and operators make data-informed decisions regarding battery usage, maintenance schedules and replacement, which will contribute to improved vehicle reliability and extended battery life.

Paper ID- 579

AI-BASED GEO INTELLIGENT SYSTEM FOR ATTACK PREDICTION AND VIRTUAL SIMULATION

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In this paper, we have focused on AI-based technologies combined with the geo intelligence and metaverse which can jointly help in defense to model and analyze complex geographic situations, allowing defense specialists to explore numerous situations and evaluate the effectiveness of different strategies before deploying resources, with the goal of improving situational awareness, response times, and decision-making capabilities across all security-related agencies. The satellite images obtained from the geo satellites give a brief description of a variety of different types of maps and visualizations, including topographic maps, vegetation maps, and thermal maps. These types of satellite imagery include infrared images, the locations of water bodies, planes, plateaus and a number of other surface structures of earth. The imagery helps in identifying the loopholes of spotting the enemy hiding locations and the risky regions of exposure of the native soldiers. The AI model can identify such locations and predict the possible threat locations. When this kind of model is deployed in the metaverse, it can help the soldiers in being trained for war zone like situations. The predictive outcome can handle and analyze enormous data more efficiently, detect possible dangers early, and respond to them quickly. This can eventually aid in the prevention of security breaches and the protection of national interests.

Paper ID- 580

MASTERING DISTRIBUTED STORAGE: ARCHITECTURAL DESIGN, PERFORMANCE ANALYSIS, AND COST ANALYSIS OF MODERN DISTRIBUTED FILE SYSTEMS: HDFS AND NFS

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As data storage and management demands grow, distributed file systems (DFS) have become critical for large-scale data handling. This paper explores two widely used DFS: the Hadoop Distributed File System (HDFS) and the Network File System (NFS). We examine core principles such as data distribution, replication strategies, and consistency models, followed by a comparative analysis of their architectures and operational

characteristics. Our evaluation measures throughput, latency, and scalability under various workloads, revealing that HDFS is optimized for big data applications, while NFS is better for traditional file sharing. Additionally, we conduct a cost analysis assessing initial setup and operational expenses, providing insights into the financial implications of each system, which guide organizations in making informed decisions based on performance and cost-effectiveness.

Paper ID- 625

THE FUTURE OF HPC AND AI

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In recent years, the world of HPC has seen two challenges. One is the end of Moore's law, the other is the impact of AI. Both will change the world of HPC as we know it. In this paper, we explore the state of HCP and AI. Looking into AI, we investigate issues of sustainability, scalability and performance. We touch on issues of precision that are relevant for classical simulations but not for AI. Given the end of Moore's law we look into new architectures that might help to continue the path of HPC. Showing a common path for HPC and AI, we present a concept which we call "Digital Convergence", bringing together HPC and AI to solve real-world problems. We finally present a number of real-world problems that can benefit from the concept of Digital Convergence.

Paper ID- 660

ANALYZING PERFORMANCE PATTERNS AND USER EXPERIENCE IN ONLINE CYBERSECURITY CHALLENGES: INSIGHTS FROM SKRCTF

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The field of cybersecurity education has undergone a significant transformation, with the emergence of innovative e-learning platforms that aim to bridge the gap between academic institutions and industry. This study investigates the effectiveness of SKRCTF, a customized Capture-the-Flag platform designed to support cybersecurity skill development, through comprehensive analysis of user performance patterns and learning experiences. Drawing from data collected from 120 participants over a 12-week period, this research employs mixed-methods analysis to examine learning progressions, engagement patterns, and skill development pathways in cybersecurity education. The findings reveal three key insights: 1. the emergence of distinct specialist and generalist learning patterns, challenging traditional assumptions about linear skill progression; 2. the identification of an optimal engagement zone that maximizes learning effectiveness; and 3. the discovery that analytical challenges serve as effective entry points for cybersecurity skill development. The study also uncovers a complex relationship between perceived difficulty and learning outcomes, where higher perceived difficulty often correlates with increased persistence rather than decreased engagement. These insights contribute to both theoretical understanding of cybersecurity skill development and practical platform design considerations. The research suggests that effective cybersecurity education platforms should support multiple learning pathways, implement structured engagement mechanisms, and carefully sequence challenges to optimize skill development. These findings have significant implications for the design of cybersecurity education programs and the development of future security professionals.

Paper ID- 700

RPI OF I SHAPED MSPA USING NB TECHNIQUE FOR X-BAND TYPE OF ANALYSIS

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Benzo-cyclobutene (r = 2.6) as a new Capacity substrate compared with Polystyrene substrate (r = 2.6) X-band applications RF properties of Micro-strip Patch antenna (MPA) Return Loss VSWR and gain capacity and comparison of new Scope RF Properties at the frequency range of 10 GHz. Sample calculation assumed 15 samples, power of 80% was applied by pretest. The properties of the new Benzo-cyclobutene substrate antenna networking to yield 10.81 10 GHz compared to: -Polystyrene substrate antenna networking -9.47 radiation pattern. Excellent RF performance of p<0.05The new Benzo cyclobutene substrate micro-strip patch antenna was superior to the Polystyrene substrate antenna, providing significantly better radiation pattern

Paper ID- 716

HARNESSING QUANTUM COMPUTING FOR NEXT-GENERATION INTELLIGENT SYSTEMS

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Quantum computing is poised to revolutionize numerous fields, including artificial intelligence (AI) and machine learning (ML), by offering the potential for vastly improved computational efficiency and speed. This paper explores the intersection of quantum computing and intelligent systems, providing an in-depth analysis of how quantum computing can be harnessed to create next-generation AI systems. We discuss the fundamental principles of quantum computing, its potential advantages over classical computing, and current applications and challenges in integrating quantum computing with AI. Additionally, we explore the future trajectory of these fields, speculating on how the convergence of quantum computing and AI will shape future technological advancements.

Paper ID- 730

ENHANCING WORKFORCE EDUCATION WITH VR REINFORCEMENT EDUCATION

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Employing reinforcement", "learning driven", "virtual reality simulations", "are changing the landscape of workforce training by facilitating data-based, immersive and dynamic, learning experiences. Indeed, there are a plethora of workforce training tools, but a lot of these tools depend on the static re-enactments which are rigid and do not provide the sort of real-time and personalized feedback to serve well the trainees different needs. Reinforcement learning is a type of machine learning algorithm that learn optimal behaviors in an environment via trial-and-error feedback from reward signals. Thus RL and the evolution it ushers for your application of VR

can give you the ability to craft training programs that immerse your trainees in behaviors they're likely to encounter as part of their day to day lives and then seem to evolve Learn the results of a and how they progress using RL would allow the app to discover this path for the most personalized learning experience. Employee has the opportunity to rehearse in VR experiences that simulate everything from day-to-day procedures to high-risk activities—all in safe and yet realistic environments. Additionally, simulations are augmented with RL algorithms which enable modeling of complex decision processes and thus more interactive training scenarios. That way, trainees can receive feedback that's

Paper ID- 734

USING CHATBOTS POWERED BY GPT-3 TO INCREASE STAFF ENGAGEMENT

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And that is the reason why employee engagement is the essence of productivity, prosperity, and job satisfaction in an organization. But so many organizations are struggling to figure out how to maintain high levels of engagement, especially in a remote and hybrid world. To address this we have integrated GPT-3 powered chatbots to interact with the employees at hand using very high level of natural language processing and machine learning approach to make human interaction making their experience better. This paper discusses the utilization of GPT-3 based chatbots in employee involvement, the usefulness of using GPT-3 based chatbots in employee engagement and the limitations and issues that can persist. GPT-3GPT-3: a language model that generates coherent and contextually relevant text based on input prompts. Because It understands and generates human-like responses, it is used for many applications, including customer service, content creation, and personal assistance. In converse of employee engagement GPT-3 powered chatbots can

Paper ID- 743

REINFORCEMENT LEARNING-BASED ADAPTIVE UTILIZATION OF RESOURCES IN CLOUD NETWORKS

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The necessity of dynamic resource allocation in cloud systems has opened door for reinforcement learning based approaches in the domain. Cloud computing services provide users with on-demand resources for various workloads with distinct service performance requirements. However, dynamic workloads, varying resource requirements, and the tension between efficient performance and cost efficiency can place significant strain on the resource management within these types of platforms. Because cloud systems are inherently dynamic processes, traditional resource allocation approaches, like manual provisioning or using predefined optimization rules, are not likely to solve the problem satisfactorily which makes adaptive approaches (like those driven with RL) as appealing alternatives. A RL-based resource allocation framework includes an agent that interact with the cloud environment by trying different actions and learns the optimal policies as a result. This usually involves specifying a reward function, where the agent receives

Paper ID- 746

BLOCKCHAIN-BASED DECENTRALIZED ASSET SHARING

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The rise of blockchain technology has resulted in new solutions appearing in various sectors and one of the boldest recent trends, distributed resource sharing. This Data up to October, 2023. Traditional models provide decentralizing of trust and software called smart contracts, Transparency, Security, Lack of interference, Motivation in untrusted conditions, Resistance to censorship, Efficient technology of sharing and managing resources. It leverages blockchain technology, whereby these burgeoning functions of distributed models for coordinated resource management can be rendered more secure, transparent, and less susceptible to fraud and abuse. The core of these blockchain-based distributed resource sharing models is decentralization. Blockchain can allow shared resources (computational power, storage, bandwidth, or even energy) between groups of participants to be decentralized without third-party broker or central authority. With its transparency, Blockchain ensures the expenditures secured, which are visible to all participants of resources Thus, making the ecosystem a safe & secure platform for resources sharing. It has become a trust between participants because no one can control shared resources

Paper ID- 753

USING BIG DATA AND KAFKA TO TRACK RESOURCE UTILIZATION IN REAL TIME

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With the scale of data in modern systems growing rapidly, the need to perform analytics in a fast and efficient, real-time way is critical as different industries — from healthcare to logistics, even for cloud computing — have to utilise a resource efficiently. Real-time Resource Utilization Analysis: Natural Language Processing, Big Data tools and Streaming Frameworks are used for monitoring, getting insight and dynamically optimizing resources. Link: Real-Time Analytics You cannot make it with Apache Kafka: A High-Throughput distributed Streaming Platform. Here in this paper we proposed strong basement for analysing on Big Data including Kafka Streams for real-time resource utilisation analysis framework and show its high executing efficiency, faster implementations, enhancing reduce for improving executing systems efficiency. The suggested framework also addresses the challenges associated with real-time ingestion, processing, and analysis of streaming data, especially considering the use of Kafka Streams as a fundamental element for distributed stream processing. Learn More About Kafka Streams Builds a Unified Processing PlatformKafka Streams can be used to build real-time business applications, or for creating real-time transformations, or processing streams

Paper ID- 754

FEDERATED OPTIMIZING FOR DISTRIBUTING RESOURCES ACROSS TENANTS

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A Federated Optimization Approach for Resource Allocation in Multi-tenant Environments Multi-tenant applications that provide common application/data/computation resource units for multiple independent users (or organizations) have implemented federated optimization techniques to optimize their utilization. PRIVACY AND AUTONOMY: Multi-tenant systems are designed to provide services to multiple tenants; thus, their privacy and autonomy must be guaranteed. Appropriately then federated optimization provides a broad basis for optimizing resource allocation across multiple tenants without centralizing the data which is an important requirement in situations where data privacy and safety of new data is paramount. In a nut shell, federated optimization for multi-tenant systems is aimed of course at decoupling the local computation for all tenants (each on their own data) from the global knowledge propagation by aggregating the local knowledge after computation of the global model that concerns all tenants. Within this collaborative learning setting, the system can improve its resource allocation plans by learning from each tenant requirements and preferences while ensuring privacy. Resource allocation in these types of systems is a fundamentally hard problem because of contention from multiple tenants that can have distinct priorities, cost objectives, and output requirements. Also, different tenants can

Paper ID- 759

DISTRIBUTED MEMORY FAST FOURIER TRANSFORMS IN THE EXASCALE ERA

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A summary of performance and software engineering concerns for the fast Fourier transform on distributed memory parallel computers is given.

Paper ID- 766

USING DEEP LEARNING TO SPOT FALSE PRODUCT PHOTOS IN ONLINE SALES

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Ways to shop for various items without stepping outside became totally feasible with the e-commerce site boost mod, and it helped change the dynamic within the retail industry. However, this online facility has also led to the penetration of counterfeit and fake goods in the market, which have posed a significant threat to consumers and manufacturers. Counterfeit product images detection on e-commerce websites is a challenging task as counterfeit products are visually highly similar to the genuine products. Due to the large volume of products in the market and a wide spectrum of means of differentiating authentic from inauthentic products, traditional means to identify them (mainly requiring human inspection or rule-based systems) are also changing, especially for counterfeit products where these means are rapidly losing effectiveness. A lot of deep learning image classification techniques is lately proposed as a good starting point for automating the detection of fake product images. In this paper, we propose to use deep learning

Paper ID- 776

CONVOLUTIONAL NETWORKS FOR REAL-TIME TRADEMARK VIOLATION IDENTIFICATION

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As an important part of the intellectual property rights protection, copyright infringement detection in the information age, is faced with threats monitored target for logos, images, social media platform trademarks. With the increase of user-generated process being located on the web, it is important to develop automatized systems allowing to identify trademarks violations in real time in order to ensure brand identity is preserved and that trademarks are not infringed upon; Traditional systems to detect trademarks are for the most part keyword-based systems or manual search, however this time-consuming, has high-margin error and does not detect complex or slight modifications of the trademark. We tackle the problem of real-time detection of trademark violations and we propose a new approach based on Convolutional Neural Networks, a powerful class of deep learning algorithms that achieve high accuracy in image recognition problems. These image-generation and real-time features extraction step provided a base that guided for the newly proposed method which uses the power of CNNs in analyzing an image at every single timestamp for potentially

Paper ID- 816

DATA EXTRACTION TECHNIQUES FOR ANALYSING AGRICULTURE SOIL FACTORS

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An essential task in supplying the world's food requirement is soil analysis. It is the backbone of agriculture, particularly in developing nations like India, so if data mining methods are used to the fields, specifically to the soils, the pledge-making scenario may be altered, improving cultivations in the process. A significant portion of the decisions made about the majority of problems pertaining to the sector of agriculture include soil analysis. In addition to highlighting several data mining methods and the corresponding work done by various authors in the context of soil analysis, the primary emphasis of this study is on the function that data mining plays in soil analysis in the agricultural area. These data mining methods are quite modern in the soil analysis domain. The study's advancedness lies in its use of sophisticated data mining tools to better understand the characteristics of the soil, its nutrient content, and possible production results. Improving soil management techniques is the primary goal, since it has a direct impact on the agricultural system's sustainability and production

Paper ID- 826

AI STRATEGIC DEVELOPMENT FOR FQASC

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They used the examples of types of artificial intelligence, integration of artificial intelligence in the food value and supply chain, other types of artificial intelligence-embedded technologies, barriers for artificial intelligence implementation in the food value and supply chain and solutions for barriers. Provide a summary of its analysis

and the horizontal and vertical integration of artificial intelligence into the entire food supply and value chain. Artificial intelligence is increasing its role in this field, and advanced technologies such as robotics, drones, smart and autonomous machines are already transforming different stages of the chain. As a general guidance from this exploration of systematics literatures, the available studies suggest that artificial intelligence does not stand alone but interacts with other technical advancements such as big data, machine learning, service institution, agribots, industrial robots, sensors and drones, digital platforms, driverless movement implements

Paper ID- 866

DEEP LEARNING FOR IMPROVED MQTT-BASED SECURITY DETECTION IN IOT SYSTEMS

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As applications in shrewd cities pick up footing, cyber-attacks and dangers within the Web of Things foundation are growing quickly. IoT gadgets frequently utilize machine-to-machine conventions like Telemetry Transport and Message Lining to associate with one another. Security measures in settings with MQTT activity are required due to the heterogeneous nature of the Web of Things and the need of security by plan approaches. These instruments may well be executed as interruption location frameworks. With the utilize of a open dataset including MQTT ambushes, this ponder proposes a Deep Learning-based Organize Interruption Location Framework. Standard execution markers counting precision, accuracy, review, F1-score, and weighted normal are utilized to assess the proposition. The comes about of our execution assessment of our DL-based Organize IDS appeared that it may recognize MQTT assaults with an normal precision of 97.09% and an F1-score of 98.33%. Our work has moreover made a critical commitment by posting the tests on GitHub, which guarantees the research's repeatability. The consistent association and interaction between organized gadgets made conceivable by the Web of Things has changed a number of segments

Paper ID- 885

FLUTTER-BASED MOBILE APPLICATION FOR MEDICARE CONSULTATION & SOLUTION

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Good medical results require sound choices, precise testing, adhering to patient needs, efficient surveillance, and right clinically evaluations for physicians as well as patients. The creation of an app for phones to aid in the provision of superior medical care is the main topic focus this essay. The primary objective of the endeavor is making it easier and simpler for clientele to make periodic visits while also addressing any potential issues clients may have. With "DOC.TIME" acting as the end-user plus Apache Lambda serving the platform, information relating to the physician, the patient's condition, & the visit are managed in an SQL database. The research presented suggests an app for smartphones to improve accessibility to health therapy. Amongst among this application's essential features include Chabot, Disorder Prediction, Discovering

Paper ID- 893

SOFT COMPUTING BASED AGRICULTURAL CROPS MONITORING AND DISEASE DETECTION

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In light of the growing need for intelligent farming, it is crucial to ensure effective development & enhanced output of plants. Tracking a plant from its development to its picking is essential in order to improve output & profitability. The paper presents the development of a system that utilizes image processing techniques to identify and monitor diseases in fruits during the entire process through planting to picking. This objective is accomplished by utilizing the idea of artificial neural network. The investigation focuses on four illnesses that affect tomato crops. The approach under consideration utilizes two picture databases. The initial dataset is utilized to train contaminated photos, while the subsequent dataset is employed for implementing additional inquiry photographs. The training dataset undergoes weight modification through the process of back propagation. The results of the study demonstrate the categorization &

Paper ID- 896

ENHANCEMENT OF THE INFRARED IMAGE THROUGH THE USE OF WAVELET THRESHOLDING

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Throughout the current study, an improved laser detection approach that uses wavelet analysis is provided. It addresses issues including the poor aesthetic impact of laser imaging beneath circumstances with poor light. The far-infrared picture is initially separated into a whispered sub-band (LFS) along with a frequent showings sub-band (HFS) depending on the introductions in accordance with waves disintegration, along with the HFS, which is within each introductions is removed by using an altered waves limit operate to enhance the thermal image's eliminating impact, Furthermore, the lighting factor in the basic level of the LFS is evaluated using the broad Retinex, or (MSR) method employing weighting directed filters (WGIF), along with these MSR treated photos are combined using the WGIF segmentation information layers photos to successfully showcase the LFS's surface features; In order to create infrared

Paper ID- 905

SOFT COMPUTING MOBILE APP BUILD DANCE CHOREOGRAPHY BASED ON THE RHYTHM OF SUPPLIED SOUND

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Not even the greatest writers in existence were endowed with an endless supply of ideas, an endless supply of ink on papers, or fingers that glided over keyboards. Writer's block is the term used to describe these creative blocks, which many people encounter because communication is crucial in all subject areas. Dancer's block is a lesser-known condition in which a choreographer loses motivation while creating [1]. Before a dancer gets an idea, such obstacles may go on for several days or weeks, which reduces the effectiveness of choreography. A

performer cannot give their best choreography when deadlines are involved, such as when choreographing for a competition, production, or project. As a result, they will be dissatisfied with the calibre of their work. How can a choreographer find inspiration to get

Paper ID- 908

DEVELOPMENT OF NEURON PROCESSING FOR DCNN WITH WEIGHT AND ACTIVATION FOR IOT

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Convolutional neural network (CNN) accelerators powered by FPGA have garnered a lot of interest lately. This is mainly because they provide a higher degree of energy efficiency when compared to Graphics processing units (G However, it can be difficult for FPGA-based solutions to outperform their Graphics Processing Unit (GPU) substitutes in terms of performance. In this research, we have demonstrated that for a neural network (CNN) taught with binarized values and the activation aspect, it can be more advantageous to use FPGA-based accelerating in regards to productivity and energy usage. An effective, fully mapped FPGA acceleration design featuring deep pipeline phases and layer normalization is demonstrated, designed to function with tiny batch sizes. Unlike the Graphics Processing Unit acceleration, the quantity of the information batch being handled does not significantly impact the processing speed of FPGA accelerators. On the other hand, the total amount of the information batch that is processed has a significant impact on graphic processing acceleration. Test findings show that compared to a Titan X Graphics Processing Unit the proposed BCNN design running on a Virtex-7 FPGA handles specific requests in small batches 8.3 instances quicker and seventy-five times more effectively.

Paper ID- 923

BLOCKCHAIN-BASED SECURE PAYMENT SYSTEMS FOR E- COMMERCE

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Blockchain technology has received a lot of interest in recent years owing to its potential to disrupt many different businesses, including the financial industry. As more and more business is conducted over the internet, the need of safe payment methods for online purchases has grown. This study's focus is on how blockchain technology may be used to the creation of trustworthy digital currency payment systems. This study takes a look at the pros and cons of using electronic payment methods at the moment. The study then investigates how blockchain technology might be used to circumvent these constraints, and it gives a thorough introduction to the several blockchain-based secure payment systems now in use. Finally, the study looks forward to the future of blockchain-based secure payment systems for electronic commerce, discussing their possible influence on the sector as a whole. This study was written for academics, industry experts, and policymakers interested in learning more about blockchain's applications in the realm of digital trade.

Paper ID- 945

FOUNDATIONS OF SMART HEALTHCARE: EMERGING IOT TECHNOLOGIES IN WIRELESS SENSOR NETWORKS

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The study examines the relationship between new technologies and healthcare, with a particular emphasis on how WSNs, or wireless sensor networks, and the World of Things (IoT) work together to create smart healthcare systems. The introduction emphasises the need for creative healthcare solutions by highlighting the growth in life expectancy throughout the world and the resulting issues created by an ageing society. The literature study explores WSN-based communication technologies for healthcare, including standards and technology for both Low Power Wide-Area Networks (LP-WAN) and Low Rate Wireless Small Area Networks. Security and privacy issues in smart healthcare are also covered. The section on the suggested methodology describes the latest advancements and applications in smart healthcare, with a focus on application domains, system architectures, and the function of crowd and crowdsensing in these applications

Paper ID- 953

SEMANTIC SENSOR NETWORK ONTOLOGY FOR FOREST FIRE MANAGEMENT DECISION SUPPORT

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Forests are essential resources for each country, since they are essential to maintaining environmental equilibrium. The negative effects of deforestation, especially those caused by forest fires, highlight the need of efficient management and monitoring. When determining the risk of a fire, giving warnings, and assigning resources for emergency management, fire weather indices are essential measures. Utilising sensor networks—Semantic Sensor Networks (SSN) in particular improves the ability to gather data on a range of meteorological factors, including temperature, relative humidity, and wind speed. Processing data streams produced by these sensors poses difficulties for estimating fire weather indicators. This methodology guarantees the system's flexibility in responding to changing circumstances, facilitating reasoning and preserving the open world's generic semantics as established by all participating ontologies. The suggested fire management system contributes to effective forest fire prevention and control by functioning in accordance with the current circumstances.

Paper ID- 958

EAPD DIAGNOSIS DIAGNOSIS USING AI

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The motivation behind this undertaking is to take a gander at the capability of computerized reasoning (Al) in giving dependable and fast diagnostics to pediatric problems. Pediatric disease determination accurately and speedily are basic for effective therapy and further developed wellbeing outcomes Nevertheless, the intricacies of these signs, as well as the shortage of pediatric specialists, make ID difficult Al has shown fantastic outcomes

in different clinical fields, including assessment, treatment, and medicine find This study examines flow progresses in involving Al strategies for pediatric sickness location, evaluating their exactness and efficacy This examination accentuates the limitations and cutoff points of Al techniques, stressing the prerequisite for more innovative work to work on their accuracy and constancy, The exploration contains cases demonstrating the viability of Al in the analysis of pediatric afflictions like leukemia, mental imbalance, and flu. The discoveries propose that Al strategies have a likelihood to further develop finding exactness and immediately, limit botches, and empower brief treatment for pediatric sicknesses. In any case, further review is expected to evaluate the appropriateness of Al methods in certifiable medical services conditions while handling issues like as information quality, interpretability, and moral worries. The paper goes on by proposing

Paper ID- 969

HIP BONE MINERAL DENSITY AND LOWER EXTREMITY PHYSICAL PERFORMANCE IN OLDER MEN AND WOMEN

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This study looked at the association between bone mineral density (BMD) and physical function in a group of community-dwelling, active seniors. Data is gathered from 927 white males, 544 black men, 723 black women, and 847 white women. Utilizing dual X-ray absorptiometry, determine the BMD of the hip (g/cm2) (femoral neck and trochanter). Knee flexor strength, repeated sitting positions, walking speed (6 m), walking endurance (400 m), and standing were used as physical performance indicators. Compared to white women, black women exhibited the strongest connection with BMD at the trochanter, according to the findings. This shows that initiatives to reduce the frequency of fractures should include improving bone density and physical fitness.

Paper ID- 1000

ENHANCED SKIN DISEASE CLASSIFICATION AND SEGMENTATION WITH U-NET AND MULTI-LAYER CNN

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Skin diseases, encompassing various cancers and dermatological conditions, are the leading health problems worldwide. Early diagnosis is essential for effective management and prevention of complications, but the existing diagnostic approaches, such as manual assessment and traditional machine learning, face problems of imprecision and inefficiency because of fewer data augmentations, inadequacy in segmentation methods, and suboptimal feature extraction. This paper proposes a robust framework, combining advanced deep learning approaches, to overcome these existing limitations. Variational Autoencoders are used for data augmentation, and the U-Net network provides accurate segmentation. A user-defined multi-layer Convolutional Neural Network (CNN) is utilized for the identification of 23 skin conditions from more than 19,500 high-quality dermoscopic images. The proposed model utilizes sequential feature extraction, increased network depth, and efficient regularization, thereby attaining 97.30% accuracy, which surpasses that of earlier studies reporting an accuracy of 82-89%. It also has real-time diagnostic explanations and offers delay and healthcare cost savings. Findings emphasize the potential of deep learning to transform dermatology by allowing for early diagnosis that is accurate, accessible, and efficient in regard to skin diseases.

Paper ID- 1043

SUSTAINABLE INTEGRATION OF ROBOTIC SERVICES IN THE HOSPITALITY INDUSTRY: ENHANCING OPERATIONAL EFFICIENCY AND EMPLOYEE SATISFACTION

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The study looks at the long-term anti-differentiation of robotic services in the hotel industry, stressing how they affect both operational excellence and Employee satisfaction at the same time. The paper examines how robotic services may facilitate workflow, lower labour costs, and support sustainable management practices using frameworks such as the service-profit chain. According to the study, when used responsibly, robot services not only improve the use of resources but also enhance worker well-being by removing chores and freeing up staff members to focus on more meaningful connections. The article ends with practical suggestions for managing hotels and governance structure to ensure that robotic services add human duties and promote an environmentally friendly, people-centric service model.

TRACK-2

Paper ID- 4

AN EXPLAINABLE AI TECHNIQUES FOR ADVANCING DIABETES PREDICTION USING MACHINE LEARNING

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Researchers have developed an automated system to identify diabetes risk. This system combines data from two sources: a collection of female patients in Bangladesh and an expanded dataset from a local textile factory. The expanded dataset includes information from 203 additional patients. The system uses several techniques to improve its accuracy. It first identifies the most important factors for predicting diabetes, then employs a special model to estimate insulin levels. It also addresses challenges like imbalanced data (where one outcome is more common) and explains its predictions using artificial intelligence techniques. This system achieved the superlative results has an 81.0% accuracy rate, 0.812 F1 score, and 0.844 Area Under the Curve (AUC)These metrics indicate strong performance in identifying diabetes risk.

Keywords: Diabetes prediction, Machine learning, Explainable AI, Feature selection, Classification algorithms

Paper ID- 32

METAVERSE IMPLICATIONS IN THE TAXATION SYSTEM

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The metaverse model is a virtual shared space created by the convergence of physical and virtual reality that has extended significant attention in the recent times. As this digital realm continues to grow and progress, its impact on various aspects of society, including taxation systems becomes increasingly significant. With the rapid tries the virtual worlds of blockchain technology and augmented reality, the attention should be paid to the metaverse's role in transforming various industries. As it is riddled with peculiar features, challenges, and opportunities, this chapter looks into the probable effect of the metaverse on taxation. The paper explores some of the major themes in which taxation will relate to the metaverse, analyzes possible alterations to the current tax structures, and reviews the challenges associated with regulation. It would also tend to discuss challenges and opportunities brought about by the metaverse on taxation authorities, businesses, and people proposing strategies for adapting the system of taxation to another paradigm.

Keywords—Metaverse model, taxation, challenges, opportunities, strategies

Paper ID- 60

iHDoc: SECURE NFC MOBILE-BASED DIGITAL DOCUMENT SIGNATURES PROTOTYPE

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Digital signatures are essential for secure data interchange. However, most document signing solutions depend on cloud-based infrastructures, which may expose users to security vulnerabilities and significant computational requirements. This paper proposes designing and implementing a proximity mobile-based iHDoc digital document

signing prototype to sign documents over a Near Field Communication (NFC) tap. It consists of Signer and Signee applications on two different mobile devices that tap to first mutually authenticate each other and then sign the document. iHDoc utilizes iDSign, a previously proposed secure and lightweight design framework based on Identity-based Cryptography (IBC). IBC eliminates the need for certificates by associating public keys directly with user identities, reducing computational and communication overhead and assisting in lightweight mutual authentication over HCE and resource-constrained mobile devices. NFC proximity reduces the risk of man-in-the-middle attacks and ensures the locality of reference. Performance comparison of iHDoc with IBC and RSA-based mutual authentication indicates that the iHDoc prototype performs better with iDSign due to reduced time and storage. It is, hence, suitable for the proximity-based, resource-constrained digital signature of documents.

Keywords: Digital Signatures, Host Card Emulation (HCE), Near Field Communication (NFC), Identity-Based Cryptography. (IBC), Mobile Devices, Lightweight Mutual Authentication, Session Key Establishment.

Paper ID- 82

PERFORMANCE ANALYSIS OF MIMO USING DIVERSITY TECHNIQUE IN VLC FSO COMMUNICATION SYSTEM

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Visible Light Communication (VLC) is a growing trend in future communication technology. In VLC systems, Free Space Optics (FSO) is used as the transmission medium. These VLC FSO systems offer solutions to congestion problems in RF communication by providing similar frequency range scalability, cost-effectiveness, and mobility. However, challenges such as weather conditions like smog and storms, as well as the need for a clear line of sight, pose significant hurdles. In this paper, wepurpose a reliable VLC system that uses MIMO with RZ, NRZ and QPSK coding with filters and amplifiers to improve performance. The system is tested over a 1500-meter link distance, achieving a simulated data rate of 10 Gbps. This proposed system is suitable for high data rate communication in VLC, with the potential to extend transmission distances by reducing signal fading in free space.

Keywords—MIMO, SISO, Visible Light Communication, OPTIC SYSTEM, FSO, LASERDIODE, BER, RZ, NRZ, QPSK Coding

Paper ID- 104

FRAUD PREVENTION IN BANKING: INNOVATIVE TECHNIQUES FOR DETECTING PAYMENT FRAUD

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Fraud detection in banking remains one of the most critical challenges, as fraudulent patterns continue changing to avoid detection. Classic rule-based methods provide a basis approach but often lead to high rates of false positives and negatives, which limiting their efficiency. Due to the rapid growth of fraud particularly in Banking Payments, tackling this challenge has become imperative. To this end, we employ the Banksim dataset-a synthetic tool that replicates the various payment behavior of customers- to assess a number of machine learning models, Support Vector Machines,Random Forest, Logistic Regression, AdaBoost and Decision trees. Our model evaluation, using confusion matrices and classification reports, demonstrates the ability of these approaches to provide precision and reliability in detecting fraudulent transactions. This research contributes to enhancing the reliability and integrity of banking services through fraud payment detection improvements.

Keywords—Fraud detection, banking, machine learning, Banksim dataset

Paper ID- 183

EDGE AND FOG COMPUTING IN CYBER-PHYSICAL SYSTEMS

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The benefits of cyber-physical system advances include low latency and high bandwidth data processing in areas such as automotive, healthcare, and business automation. Traditional environments are often located in centralized and remote locations and cannot meet the demand. Edge computing and cloud computing have become fundamental concepts that will bring computing closer to the center of the data. Edge computing can reduce latency and bandwidth consumption by processing data on or near IoT devices. Fog computing adds another layer to this by distributing work and storage across multiple nodes, thus providing a scalable and flexible infrastructure. This article discusses the principles, benefits, and challenges of integrating edge and cloud computing into a CPS environment. It leverages the power of proximity-based edge computing and the centralized capabilities of cloud computing to provide scalable, instantaneous responses to CPS applications or time to optimize services. The demonstration shows a variety of things from smart cities to the use of IoT in healthcare in CPS. The article also covers some specific security and privacy issues and future directions in distributed computing, including the role of AI and 5G, which are supposed to offer additional resources in various applications.

Keywords— Edge Computing, Fog Computing, Cyber Physical Systems (CPS), Data Processing

Paper ID- 220

IMPLEMENTATION OF HEXAGONAL OPEN-LOOP RESONATORS UTILIZING THE FSC TECHNIQUE FOR CHIPLESS RFID TAG SOLUTIONS

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This paper presents a novel design for a compact planar multi resonator customised for chipless RFID tag applications, with a focus on optimising encoding efficiency. The tag features three hexagonal slots, meticulously incorporated into the underside of a 50Ω microstrip transmission line. The operational frequency range extends from 2.12 GHz to 5.45 GHz, yielding a total bandwidth of 3.33 GHz. Detection information is encoded in the spectral domain through Frequency Shift Coding, enabling the generation of a maximum as 343 unique codes utilising three resonators. This tag is distinctive for its capability to generate distinct resonant frequencies through alterations in the slot dimensions. The design and simulation were conducted on an RT5880 substrate, which has a dielectric constant of 2.2 and a remarkably low loss tangent of 0.0009.

Paper ID- 240

IoT-BASED INTELLIGENT POWER MONITORING AND CONTROL FOR GRID-INTEGRATED SOLAR POWER IN DOMESTIC LOAD

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IOT Power Monitoring System for Grid-connected Solar Power Systems is designed to improve the performance and reliability of solar panels used in residential homes. The system records the daily energy consumption of the grid by monitoring the energy produced by solar panels, allowing a better understanding of energy production and consumption. A key innovation of the system is the integration of a temperature sensor and an automatic water spraying mechanism to solve the problem of reduced efficiency due to an increase in temperature. When the thermometer detects an increase in temperature above the threshold, the sprinkler is activated to cool the panels, thus maintaining the efficiency of the panels. In addition, to ensure that the system is effective and efficient, apotentiometer is included to measure the actual current produced by the solar panel; this allows real-time monitoring and reporting of power measurements on the Internet of Things. The monitoring system allows home users to track energy production, monitor performance and understand their daily energy usage, enabling management that controls efficiency and electricity quality. Using IOT technology, users can access information about energy production, grid usage and battery panels via online platforms, perform remote monitoring and data analysis. The integration of temperature control now allows solar panels to perform at their best, providing an efficient way to use the sun for home energy needs.

Keywords— IOT-enabled power monitoring, Grid-connected solar power, Intelligent Controller, Smart domestic energy management.

Paper ID- 264

A COMPREHENSIVE STUDY FOR APPLICATION OF BLOCKCHAIN TECHNOLOGIES FOR THE DECENTRALIZED GRID UTILIZATION POSSIBILITIES

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This thorough research explores the world of blockchain technology and its significant effects on the use of decentralized grids. Decentralized networks have shown promise in addressing the rising need for renewable energy and effective resource management. Blockchain, a technology based on distributed ledgers, presents creative approaches to improve grid oversight, enable through peer-to- energy trade, and guarantee openness and protection in the management of the grid. This paper investigates the advantages and disadvantages of using blockchain in decentralized grids. From trading in renewable energy to grid optimization and demand response, we examine a variety of use cases and applications. We offer insight into the practical viability and scalability of blockchain-based solutions through a thorough analysis of real-world deployments and case reports. We also talk about the legislative and technological challenges that need to be solved if blockchain technology is to reach its full potential in decentralized grid setups. Our research emphasizes the value of regulatory architectures, seamless integration, and

standardization for promoting the smooth adoption of blockchain technology throughout the world. This study offers lawmakers, industry participants, and investigators working to build a sustainable and effective energy future an informative tool by illuminating the potential and constraints that blockchain technology presents in an environment of decentralized grid utilization

Keywords—Distributed ledger, peer-to-peer system, intelligent medical care, and blockchain-based applications.

Paper ID- 325

MULTIRESOLUTION FEATURES FOR SONIC LOG CLASSIFICATION

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This study highlights the significance of precise DTC and DTS values for reservoir characterization and presents a unique method for sonic log prediction in the oil and gas sector. To improve prediction accuracy, the approach integrates signal processing—more especially, wavelet transformation—with machine learning. Wavelet transformation on seismic signals, feature extraction, dataset preprocessing, and machine learning model training are all steps in the process. The accuracy of the results is an astonishing 87.5 percent, outperforming previous algorithms. The extensive and varied data set used guarantees the model's resilience in a range of geological situations. The suggested method improves reservoir characterization confidence by making a substantial contribution to precise wave velocity estimation. All things considered, the study provides a workable and efficient way to enhance sonic log forecasts, which will help with hydrocarbon exploration and petroleum industry decision-making.

Keywords—Machine learning, Sonic Log Prediction, Wavelet transformation, Discrete Transform

Paper ID- 470

ADAPTIVE EVOLUTIONARY NEURAL NETWORKS FOR RESILIENT ANOMALY DETECTION IN DECENTRALIZED SWARM ROBOTIC COMMUNICATION SYSTEMS

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This paper presents EvoCommNet, an adaptive evolutionary neural network designed specifically to find abnormalities in response to communication dynamics of robotic swarms inspired by foraging and exploration behaviours. EvoCommNet employs an evolutionary neural network to detect abnormalities in the swarm communication which might be indicative of problem with the system. Thus, through these evolutionary process, EvoCommNetoptimises its structure to effectively detect anomalous behaviour with low computational requirements that will make the solution ideal for real time monitoring in resource limited environments. Designed and trained with PyTorch and tested on one unified swarm communication dataset, the vulnerability of the model to dynamic swarm communication patterns is evidenced and, therefore, the model should be useful and necessary in areas where communication continuity and proper abnormality detection are necessary for mission accomplishment.

Keywords—EvoCommNet, Swarm Robotics, Anomaly Detection, Adaptive Neural Networks, Communication Patterns.

Paper ID- 481

NETWORK CODING FOR EFFICIENT MOLECULAR DATA TRANSMISSION IN CANCER RESEARCH

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Efficient transmission of molecular data among labs is crucial for advancing cancer research and fostering collaboration. However, traditional data-sharing methods often cause delays, impeding research progress. This paper examines the role of network coding in improving the speed and efficiency of data transmission within cancer research. We analyze the limitations of current approaches, emphasizing the benefits of network coding as a transformative solution. The methodology of network coding is detailed, supported by a mathematical model demonstrating its effectiveness in optimizing data transfer processes. Furthermore, practical challenges and potential solutions for implementing network coding in real-world scenarios are discussed. By addressing these barriers, this paper highlights the potential of network coding to significantly accelerate data sharing, thereby enhancing the pace of discovery and innovation in cancer research.

Keywords—Network coding, cancer research, data transmission, efficiency.

Paper ID- 483

ADVANCED MACHINE LEARNING APPROACH FOR CYBER ATTACK DETECTION IN CLOUD COMPUTING

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Cloud computing has become the most important part of modern IT infrastructure, which is scalable and flexible. However, with such wide-scale adoption, new vulnerabilities have been introduced into the system, making it a favorite target for cyberattacks, especially Distributed Denial-of-Service (DDoS) and Man-in-the-Cloud (MitC) attacks. Security measures in cloud environments are more than ever required to be effective. This study introduces a state-of-the-art approach using machine learning techniques to identify and prevent such attacks; the four machine learning algorithms that have been used here are Support Vector Machine, Artificial Neural Network, Recurrent Neural Network, and k-Nearest Neighbors. A dataset of 3,200 simulated records has been used for the purpose of training and testing; 70% of data were used for training purposes, and 30% of data were used for testing purposes. The models were rated based on precision, running time, and memory usage. The results highlighted that SVM was the strongest model and had an accuracy of 97.86%, while ANN was about 93.4% followed by RNN which was about 89.45% and KNN at 86.7%. This would mean that among the above models, the SVM is the most efficient with respect to real-time attack detection as it is in high precision and has efficiency in resource use. The proposed approach can be very well applied to real-time cloud security systems, offering a robust solution in identifying and mitigating cyber threats in dynamic cloud environments, ensuring enhanced protection against evolving attack vectors.

Keywords—Cloud computing, Cyberattack detection, Machine learning, DDoS, Man-in-the-Cloud.

Paper ID- 487

ORBITING INNOVATION WITH THE IMPACT OF DEDICATED SATELLITE MISSIONS ON REMOTE SENSING CAPABILITIES

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The offered approaches were thoroughly tested. This study measured space resolution, spectrum correctness, and temporal consistency. While studying ablation, researchers identified critical sections' responsibilities. Side-by-side comparisons showed that the supplied solutions were better. These discrepancies were obvious when spatial detail was determined using various approaches. The new approaches outperformed the previous ones, which had an average SR of 0.5 meters and a range of 1.2 to 1.5 meters. This procedure was far better than others. Spectrum-accuracy studies indicated improved grouping abilities. Normal procedures scored 3.0–3.5 on the SA scale, whereas alternative approaches scored 2.5. A low temporal consistency score of 0.8 indicated stability for the offered strategies. This differs from the traditional method of measuring temporal homogeneity using 1.0–1.5. This notion was highlighted by temporal consistency measurements. The ablation experiments showed that each aspect was significant, but quantum communication was the most necessary for operating the complete system. The technologies described were technically brilliant and launched a new age of satellite-based remote sensing. Finally, the approaches became more technologically sophisticated. Dedicated satellite missions will revolutionize environmental tracking, disaster management, farming planning, and urban planning. These journeys will have the best geographic resolution, spectral accuracy, and temporal consistency ever. Satellite initiatives will eventually improve Earth's understanding and resource management. This is now feasible using the framework. Smart utilization of emerging technology has made this future possible

Keywords: Agriculture, Autonomous Operations, Data Compression, Environmental Monitoring, Quantum Communication, Remote Sensing, Satellite Missions, Spatial Resolution, Spectral Accuracy, Urban Planning.

Paper ID- 494

IMPLEMENTING BLOCKCHAIN FOR TRANSPARENT AND SECURE FINANCIAL TRANSACTIONS IN THE MODERN BUSINESS WORLD

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The main point of this study is to find out how blockchain technology might be able to help make business financial deals safer and more open. Blockchain technology is changing the financial world because it creates a global record system that can't be changed. These tools are making this change happen. Three parts are used in the method given to create a safe system: the Elliptic Curve Digital Signature Algorithm, Proof of Work agreement, and Merkle Trees. In this method, Merkle Trees are also used. These techniques are used by this system to investigate not only the data, but also the security of the cryptography and the proof that comes from outside the system. To find out how well firewalls, audit trails, SSL encryption, multi-signature wallets, and role-based access control work, the components must be compared to them. Using this method could have several benefits, such as decentralization, immutability, openness, correctness, foreign access, automation of smart contracts, and increased efficiency. According to the study, blockchain technology can make information easier to find, speed up financial transfers, and reduce concerns about security

Keywords-Blockchain, Business, Decentralization, Financial Transactions, Innovation, Security, Smart Contracts, Technology, Transparency, Trust.

Paper ID- 501

A STUDY ON LiFi AND VISIBLE LIGHT DATA CONNECTIVITY EXPLORING HIGH-SPEED, SECURE DATA TRANSMISSION IN WIRELESS COMMUNICATION

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As an innovative wireless communication technology, LiFi, derived from visible light to transmit data, will be a new choice of alternative to classical radio frequency (RF) communications. Data can be transferred backward and forth between the user and a computer with high speed using rapid modulation of LED light bulbs, a technique known as LiFi. An Internet of Things (IoT) based visible light data connectivity system for efficient data transmission over LiFi technology is introduced in this paper in the form of IoTVLDC. Visible light communication (VLC) smart systems are called LiFi, they make use of enhanced bandwidth and resistance to electromagnetic interference. LiFi can operate within the 60 GHz spectrum and achieves data rates in excess of 10 Mbps, compared to the several Mbps reacheable through conventional WiFi systems. Several gaps exist: in particular, how LiFi performs in dynamic environments and energy efficiency metrics, as well as how it can coexist with RF based systems. This study will then evaluate these aspects and propose a hybrid system that combines traditional technologies and LiFi to provide seamless connectivity between lit and non lit. The study will also examine the possibility of its use in real world IoT applications, for example smart homes, industrial automation and secure communications in networks. This paper will demonstrate through extensive experimentation that LiFi technology can provide sustainable, secure, and more efficient communication solutions for the future of wireless networking

Keywords—LiFi Technology, Visible Light Communication (VLC), IoT-based Wireless Data Transmission, Hybrid LiFi-RF Systems, Energy-Efficient Wireless Communication, High-Speed Data Transmission.

Paper ID- 503

DESIGN AND IMPLEMENTATION OF SIGNAL PROCESSING FOR 2D SCANNING RADAR WITH MULTI-REFLECTION DETECTION USING 60 GHz NRD GUIDE PULSE RADAR

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The design and implementation of a signal processing system for a two dimensional (2D) electric scanning radar using multi-reflection detection to identify short range object using 60 GHz NRD (Non Radiative Dielectric) guide pulse radar is presented in this research paper. Designed to increase detection accuracy and precision by processing multiple reflections of the transmitted signals in order to recognize objects at short distances, the radar system is the one. The signal processing algorithms are adapted for MPTS handling, and the system takes advantage of the high frequency properties of the 60 GHz NRD guide. Hardware design, simulation results, and performance evaluation regarding the detection accuracy, range resolution, and processing latency, are also discussed. However, applications like autonomous driving, indoor navigation, and industrial automation require short range, high precision radar system, and this approach offers a big advantage

Keywords—2D Scanning Radar, Multi-Reflection Detection, 60 GHz NRD Guide,Pulse Radar,Short-Range Detection,Signal Processing.

Paper ID- 508

AI-POWERED 6G NETWORKS: TRANSFORMING WIRELESS COMMUNICATION WITH INTELLIGENCE AND TERAHERTZ WAVES

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From 2027 to 2030, Sixth Generation (6G) wireless communication systems are expected to be launched to revolutionize human and machine interaction with ultra fast data transmission speeds and low, or virtually zero latency communication. In this paper, we investigate the transformative potential of 6G networks enabled by AI, and describe key 6G network technologies, including artificial intelligence (AI), machine learning (ML), and sub miiitter wave technology. In addition to being able to exceed 5G Maximum Throughput (MT), 6G is forecast to enable advanced applications including holographic communications, XR (extended reality), and ubiquitous M2M (machine to machine) interaction. Although significant obstacles remain with respect to security, energy efficiency, and spectrum management. In this paper, 5G development existing gaps are identified, and a comprehensive AI driven framework for resource allocation, latency reduction, and spectrum utilization optimization is proposed for 6G systems. This study further explores the position of edge computing, IoT integration, and AI powered network security protocols. Finally, we demonstrate real world applications, such as smart healthcare, autonomous vehicles, and space communications, discussing privacy and sustainability aspects of 6G technology.

Keywords—6G Wireless Communication, Artificial Intelligence in 6G, Machine Learning for Wireless Networks, AI-Driven Resource Allocation, Terahertz Communication, Holographic Communication, Extended Reality (XR) in 6G.

Paper ID- 509

ADVANCED TEMPORAL FORECASTING MODELS FOR ENERGY CONSUMPTION PREDICTION USING RECURRENT NEURAL NETWORKS AND ADDITIVE DECOMPOSITION TECHNIQUES

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In this paper, the performance of two popular time series forecasting techniques, LSTM and Prophet, is analyzed to forecast energy consumption. Probably, one of the most important aspects for achieving efficient grid balance and resource management is energy demand forecasting. The data used in research includes energy consumption data which were cleaned from noise level and then normalized for model usage. In both models, outcomes are compared to performance measured on historical dataset. Mean Absolute Error (MAE) Root Mean Square Error (RMSE). LSTM, a Recurrent Neural Network which is extensively used for processing sequential and temporal data is compared with Prophet, a statistical model built by Facebook especially for analyzing seasonality and trends in time series data. The analysis shows that both approaches have their advantages and disadvantages and reveals how more accurate energy consumption forecasting might be achieved by employing a combination of the strategies. Comparing different evaluated models and their performance, possible variations in field application depending on the type of model and characteristics of the data set are described.

Keywords—Energy consumption forecasting, LSTM, Prophet, Time series analysis, Model comparison.

Paper ID- 510

SEMANTIC ATTRIBUTE MAPPING FOR ZERO-SHOT OBJECT CLASSIFICATION IN DEEP LEARNING NETWORKS

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One of the successful approaches to deal with the issue in object classification is the ability of the model to recognize categories that it has not seen before, referred to as the zero-shot learning or ZSL. This work aims at training and testing ZSL methods on a standard benchmark known as Animals with Attributes 2 (AwA2). In this work, CNN, to be precise ResNet is used for feature extraction after which a semantic attribute of each class is used for classification. These then are the semantic attributes of objects The ZSL model aligns the visual features from unseen objects to these attributes for classification. Evaluations based on top 1 and the top-5 accuracy to know if the model is likely to generalize to other classes. To ensure the system is computationally efficient and scalable, TensorFlow/Keras is used for the CNN features, and Hugging Face transformers for attribute features

Keywords—Zero-shot learning, object classification, convolutional neural networks, attribute-based classification, AwA2 dataset.

Paper ID- 511

DESIGN AND IMPLEMENTATION OF REAL-TIME WIRELESS SENSOR NETWORK PROTOCOLS WITH RELAY NODES AND LOCALIZATION METHODS FOR EFFICIENT SYSTEM PERFORMANCE

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In this research paper we focus on the design and implementation of reliable real time wireless sensor network (WSN) protocols that make use of relay node and proper localization techniques to enhance the performance of the system in real time applications. However, Wireless Sensor Networks (WSNs) offer a very important application in environmental monitoring, industrial control, and smart cities. Maintaining efficient communication protocols and accurate real time localization of sensor nodes, especially in environments with dynamic topologies, is one of the key challenges. This paper presents a robust WSN protocol with relay nodes which achieve both energy efficiency and communication efficiency. Additionally, it examines specialized localization algorithms for use in real time systems that offer enhanced localization precision without sacrificing system performance. Results show the reliability, scalability and energy efficiency of WSNs if utilized in real time applications can be highly improved using the optimized protocols that are coupled with localization techniques.

Keywords—Wireless Sensor Networks (WSN), Real-Time Systems, Relay Nodes, Localization Methods, Energy Efficiency, Communication Protocols.

Paper ID- 549

NETWORK CODING FOR FAULT-TOLERANT TRANSMISSION OF BIOMEDICAL DATA

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This paper introduces a novel approach to enhance fault-tolerance in biomedical data transmission using network coding methods. In healthcare, even minor data loss or delays can have severe consequences, especially during remote medical procedures or emergencies. Traditional error correction methods struggle with adverse network conditions, leading to extended transmission times and data loss. Network coding encodes data packets so the original data can be reconstructed even when some packets are corrupted or lost, reducing the need for retransmissions. Simulations show a 20% improvement in fault tolerance over conventional techniques. The approach is scalable, handling diverse biomedical data, from vital signs to complex signals like ECG and EEG, ensuring reliable transmission in various network conditions. This method offers an efficient, robust solution for real-time biomedical data transmission, addressing existing limitations and advancing healthcare technology.

Keywords—network coding, data, healthcare, fault tolerance, biomedical.

Paper ID- 553

NETWORK CODING FOR EFFICIENT DATA TRANSMISSION IN COVID-19 GENOMIC RESEARCH

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We looked at the potential impact of network coding in terms of efficiency during the transmission of data related to protein folding simulations. Classical methods for data transmission encounter significant inefficiencies arising from the loss of packets. Our method utilizes algebraic combination for improving transmission efficiency while using network coding for efficient transmission of packet data. Results from tests showed that the network coded achieved high improvements: while packet loss rates were set at 10%, 20%, and 30% respectively, the network was transmitting 120 Mbps, 90 Mbps, and 60 Mbps. While this was in contrast to 80 Mbps, 60 Mbps, and 40 Mbps for the traditional methods used. This means that every one of the scenarios had been improved by a consistent rate of 50%. This research explores the possibility of network coding improving data transmission in high packet loss environments, thus speeding up simulations and improving resource management. Network coding will lead to faster and more accurate results in protein folding simulations, significantly benefiting computational biology and related fields.

Keywords—Network coding, genomic data, COVID-19, data transmission, high-throughput analysis.

Paper ID- 618

INTELLIGENT POSTURE DETECTION SYSTEM FOR IMPROVED ERGONOMICS

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This paper describes a smart posture detection system designed to promote proper sitting habits and prevent musculoskeletal disorders. The system uses two ultrasonic sensors to measure the user's distance from the backrest, detecting slouching or excessive leaning. Additionally, four half-bridge load cells measure weight distribution on the seat, ensuring balanced support. By combining these measurements, the system identifies posture irregularities and provides real-time feedback, prompting users to adjust their position. This cost-effective and accurate solution is suitable for various settings, including homes and workplaces, and offers an alternative to traditional posture correction methods. By continuously analyzing these inputs, the system identifies posture irregularities and offers real-time feedback to prompt the user to adjust their position, thereby fostering healthier ergonomic practices Unlike conventional posture correction methods, this hybrid approach combines simplicity, accuracy, and cost-effectiveness, making it particularly suitable for large-scale adoption. This research contributes to the growing field of smart health monitoring systems, paving the way for future advancements in preventive healthcare technologies

Keywords*:* Posture Detection, Ultrasonic Sensors, Load Cells Real-Time Feedback, Ergonomics, Weight Distribution Monitoring, Smart Chair, Slouch Detection, Affordable Posture Correction

Paper ID- 6

OXYGEN EXTRACTION AND BLOOD TRANSPORT IN THE HUMAN RETINA: A MATHEMATICAL MODELING AND ANALYSIS

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This study aims to describe the intricate flow of blood within the retinal tissue. The main findings of this research are the introduction of a quantitative method to calculate total oxygen extraction using retinal measurements of total blood flow, providing a crucial link between blood flow dynamics and oxygen transport. To analyze the problem, the authors employ a perturbation procedure, a mathematical approach that simplifies complex systems by introducing small changes to the variables. This approach facilitates a deeper understanding of the interplay between flow mechanics and oxygen delivery in the retina. The study's findings hold potential for advancing knowledge in retinal physiology and could pave the way for improved diagnostic and therapeutic strategies for retinal vascular diseases.

Keywords: Blood flow; Oxygen Extraction, Retina.

Paper ID- 58

FRAMEWORK FOR PREDICTING SUICIDAL ATTEMPTS USING HEALTHCARE DATA AND ARTIFICIAL INTELLIGENCE

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Framework for predicting suicidal attempts using healthcare data and artificial intelligence. This research proposes a framework for predicting suicidal attempts using healthcare data and artificial intelligence. The objective is to develop a robust and reliable model that can identify individuals at high risk of suicidal behaviour. The study utilizes various machine learning algorithms to analyse a comprehensive dataset of healthcare records and identify patterns indicative of suicidal risk. The framework aims to assist healthcare professionals in early intervention and prevention strategies, ultimately reducing the incidence of suicidal attempts. The expected outcome is a robust and validated model that can predict suicidal attempts with a high degree of accuracy. This model will be incorporated into existing healthcare systems, enabling timely identification and intervention for individuals at risk. The framework will contribute to reducing the incidence of suicidal attempts and improving mental health outcomes.

Paper ID- 213

ROVING CRABBER IN AQUATICS

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Underwater pollution, mainly due to the release of plastics and other waste materials, poses a great hazard to marine ecosystems and human health. To deal with this, "CRABBER" is a waste-gathering underwater robot designed to fight pollutants in fresh water marine environments prepared with sensors, IoT, machine gaining

knowledge of, and picture processing, it autonomously collects submerged waste, captures underwater photos, and video display units pollution levels. the usage of wi-fi verbal exchange for facts sharing, "CRABBER" offers a smart option to reduce dangerous materials, supporting sustainable waste control and marine conservation techniques.

Keywords: Pollution, Crabber, Robotics, Plastics, Sensors, Artificial Intelligence, Automation, IoT, Image processing

Paper ID- 216

THE IMPACT OF HUMANOID ROBOTS ON HUMAN COLLABORATION AND WORKFLOW OPTIMIZATION W.R.T. TESLA COMPANY

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Humanoid robots are replacing humans with their advance technologies and bringing changes in industries, as they can collaborate with humans and improve the workflow of the organization. The Humanoid robots help in increasing efficiency in operational workflow and improve human collaboration. Robots that can perform risky tasks, reduce error, and repetitive tasks without any break and helps in improving safety, allowing human employees to focus on their work and achieve targets on time which helps the organization in growth. This Research gives the interaction between human and robots, highlighting the importance of technology in maximizing effectiveness and efficiency. The study also includes about challenges such as high initial cost, communication barriers, continuous training, maintenance, and according to the situation changes in robot qualities. The qualitative data collected from Tesla provided information about robots and how humanoid robots contribute to workflow and maintain collaboration. Ultimately this research aim is to understand the humanoid robots in industries and their workflow in organizations', collaboration with human sand shaping the future of work.

Keywords: Humanoid Robots, Tesla, Human Collaboration, Workflow Optimization, Industrial Automation

Paper ID- 237

PERFORMANCE ANALYSIS OF THE REDUCED ORDER MODELS OF AUTOMATIC VOLTAGE REGULATOR (AVR) SYSTEM

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The Automatic Voltage Regulator (AVR) plays a unique role in the functioning of the electrical grid. The AVR's complexity stems from the fact that its transfer function is of a higher order. Therefore, the analysis of higher order AVR systems results in a challenging task. Hence, the lower order models of AVR have been developed and examined in this work. Pade's approximation, Big Bang Bing Crunch, and Particle Swarm Optimization are utilised to acquire reduced order models of the AVR system. In addition, the simplified AVR models have had a PID controller developed for them utilising both IMC and the conventional Tyreus-Lyuben (TL) techniques. Time response characteristics, stability margins, and performance indices have been evaluated

between the TL-PID and IMC-PID controllers. Results from a comparison of the proposed PID controllers show that lower-order models of the AVR system function well in comparison to their higher-order counterparts.

Keywords—Model order reduction (MOR), PSO, Pade's Approximation, BBBC, Automatic voltage regulator (AVR), TL-PID Controller, IMC-PID Controller**.**

Paper ID- 280

CYBERSECURITY AND BEHAVIORAL BIOMETRICS: ADVANCEMENTS, CHALLENGES, AND FUTURE DIRECTIONS IN AUTHENTICATION SYSTEMS

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In today's digital landscape, the security of personal and organizational data faces increasing threats from sophisticated cyberattacks. Traditional authentication methods, such as passwords and tokens, are proving insufficient in defending against these evolving threats to improve authentication systems in response, the use of behavioral biometrics has become a viable strategy. Behavioral biometrics leverages unique patterns in human behavior, such as typing rhythm and touchscreen gestures, to continuously verify user identities with high accuracy and minimal user friction. This paper explores the advancements in behavioral biometrics, including the application of machine learning algorithms to analyze and interpret behavioral data. It also examines the challenges, such as privacy concerns and algorithmic reliability, that hinder widespread adoption. Furthermore, the paper discusses future directions for authentication systems, envisioning the integration of behavioral biometrics with technologies like artificial intelligence and blockchain to strengthen security and privacy protections. In order to shed illumination for the potential and challenges of using behavioral biometrics to improve cybersecurity measures for people and organizations in the digital age, this paper will analyze these topics in-depth.

Index Terms— Behavioral Biometrics, Authentication Systems, Cyber security, Machine Learning, Keystroke Dynamics

Paper ID-548

SYSTEM APPROXIMATION USING POLE SPECTRUM ANALYSIS (PSA) AND MODIFIED CAUER CONTINUED FRACTION METHOD

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The manuscript presents an advanced approach for reducing large-scale Linear Time-Invariant (LTI) dynamic systems, utilizing a combined framework that integrates Dominant Pole Retention (DPR), Pole Spectrum Analysis (PSA), and Modified Cauer Continued Fraction (MCCF) method. The denominator dynamics of the reduced-order model are extracted via the PSA integrated with a pole dominance technique, while the numerator dynamics are obtained through MCCF method. Notably, for higher-order stable systems, the approach significantly guarantees the stability of the reduced-order system. To substantiate the efficacy and fidelity of the proposed technique, a set of numerical exemplars sourced from literature has been rigorously analyzed. Comparative evaluations have been conducted, leveraging performance indices and response congruence metrics to benchmark the alignment between the original and reduced-order system responses, thereby affirming the robustness and precision of the proposed reduction method.

Keywords- Pole spectrum analysis, Pole centroid, System stiffness, System order reduction, Error indices

Paper ID- 582

FRACTIONAL ORDER PID CONTROLLER DESIGN AND TUNING VIA OUSTALOUP APPROXIMATION FOR TCLAB SYSTEM

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Implementing a Fractional order PID controller is challenging in Industry 4.0 because of computational limitations in programmable logic controllers (PLC). The Oustaloup Approximation (OA) method is used in this study to design and tune a PID controller for the Temperature Control Lab (TCLab) system. The two extra parameters in PID controllers increase flexibility and improve system performance in comparison to conventional proportional integral derivative (PID) controllers. The OA makes practical implementation easier in digital systems like PLC by approximating fractional operators over a certain frequency range. The most significant performance metrics, like overshoot, rise time, settling time, and steady-state error, have been optimized for the FOPID controller using Genetic Algorithm. The notable advantages of temperature regulation include faster reaction time and less overshooting, which are observable in the TCLab system. This study highlights the potential of PIλDμ controllers for complex temperature-dependent systems and uses inexpensive experimental setups to provide insights regarding their practical applicability.

Keywords*:* Fractional order PID controller, FOMCON toolbox, Genetic Algorithm, MATLAB, Tclab.

Paper ID- 672

AUTOMATIC DOOR OPENING SYSTEM USING RFID AND ARDUINO SYSTEM

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Among the many potential applications of inexpensive radio frequency identification (RFID) technology are security, tracking assets, people monitoring, supply recognition, and access control. This project's principal objective is to design and develop a digital security system suitable for deployment in are stricted are a that can only be accessed by authorized users. As part of our security system, we included a mechanism to lock the doors. The system is able to do the job because it uses RFID technology in conjunction with Arduino. The system obtains the user's unique identification (UID) and checks it against the stored UID when the RFID scanner at the entry detects an RFID tag. Access is given or refused based on whether the user's captured UID matches one of the stored UIDs. The system's three most important components are an electrical locking mechanism, an Arduino micro controller, and an RFID reader module. The RFID reader will verify the card's validity, and then the Arduino microcontroller will use that information to start the lock. The results prove without a doubt that the system is an efficient, dependable, and cost effective way to give or restrict access in a protected setting.

Keywords—RFID, Arduino UNO, RFID Module, RFID tag Identification, Security.
Paper ID- 681

HEART PLAQUE DETECTION SYSTEM DESIGN USING A ML TECHNIQUE "NAIVE BAYES AND LSSVM

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It is generally acknowledged that the prediction of cardiovascular disease is essential for informing practitioners and hence allowing educated health-related decisions to take place. Early identification is algorithmically seen to motivate lifestyle changes if appropriate and also ensure ideal medical therapy if needed in the population. Given that early intervention is known to be beneficial, machine learning (ML) appears as a valuable tool for predicting and gaining insight into heart disease symptoms. Our study adds to this knowledge base as it demonstrates that the Naive Bayes algorithm was a better predictor of cardiac plaque disease than the LSSVM method. The goal of the research work is to conduct heart plaque diagnosis using Naive Bayes algorithm and compare the accuracy with Least Squares SVM algorithm. The study divides the Naive Bayes method and the Least Squares SVM algorithm into two separate groups, with 20 samples being used to derive G power from the Kaggle dataset from the heart plaque disease depending on Clinical with a 95% confidence interval. LSSVM

Keywords: Heart plaque detection, Naive Bayes algorithm, Least Squares SVM algorithm, accuracy, Kaggle dataset, Clincalc, training set, test set.

Paper ID- 688

AN OVERVIEW OF ONTOLOGY LEARNING METHODOLOGIES AND SYSTEMS AS A SUBSET OF ONTOLOGY ENGINEERING

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The ontology functions as a universally accepted framework for the representation, exchange, and reuse of knowledge. Due to its importance, multiple approaches have been proposed for building ontologies. However, the process of constructing ontology is a challenging and time-consuming endeavor. Various strategies have been put in place to assist ontology engineers in addressing the obstacle of knowledge acquisition. This work seeks to offer a succinct introduction of ontology learning methods, examining several systems and tools for extracting ontologies, and concludes with a

Keywords: Ontology Engineering, Ontology Learning, Ontology Learning Systems, Ontology Evaluation

Paper ID- 697

UTILIZATION OF CONVOLUTIONAL NEURAL NETWORKS (CNNs) IN SEVERAL ASPECTS OF MEDICAL IMAGING: A REVIEW

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Medical image analysis is the profession that analyzes images produced in health conditions primarily to address clinical challenges The primary goal is to gather information in the most efficient and effective manner, and consequently to improve clinical diagnosis. The tremendous advances in biotechnology have increased the importance of medical imaging analysis in research and development. A major factor driving this growth is the

integration of machine learning, especially deep learning, into medical imaging Deep learning is a powerful learning tool that uses neural networks for object recognition autonomous, unlike traditional methods that rely on man-made features. Deep transformation networks, a subset of deep learning techniques, are widely used in various areas of medical image processing. These functions include separation, abnormality detection, disease classification, electronic diagnosis, and retrieval. This paper provides a comprehensive review

Keywords: Medical image analysis, segmentation, classification, computer-aided diagnosis, and convolutional neural networks.

Paper ID- 705

MACHINE LEARNING WITH ARTIFICIAL INTELLIGENCE: TOWARDS A BROAD CONSENSUS

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Over the last ten years, "computer science" and "AI." applications have gained popularity. In scientific and the public, both phrases are widely used, oftentimes with the same interpretation and other time with distinct connotations. In this study, we want to define the link between all these concepts and, more specifically, to define how automation contributes to intelligent machines. In this article, we analyze pertinent material and provide a basic framework that describes how machine learning is used to create (artificial) ai systems. Therefore, our goal is to increase typological consistency and serve as a foundation for future work and (cross - functional and cross) conversations.

Keywords: AI, Framework, Cross Functional, Machine Learning, Test Sets and Sub-Systems.

Paper ID- 714

SAE BASED DL APPROACH FOR ETF SYSTEM

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High rate of urbanization and economic growth has increased the volume of traffic in all part of the world. Intelligent traffic maintenance can, not only increase the movability of the vehicle but will also reduce the fuel cost. In summary, the research developed a new deep learning-based method for predicting traffic flow based on a stacked autoencoder model that takes into accounts the temporal dependencies in the dataset, and improves the representational capacity of the data. This improved representation will result in better forecasting accuracy of the model. This method uses the unsupervised learning methodology autoencoders to model more accurate prediction methodology for traffic prediction by stacking the autoencoders. The findings of this work demonstrate that this strategy performs better than conventional methods.

Keywords: Traffic prediction, deep learning, machine learning, auto-encoder, unsupervised learning, hyperparameters, transportation system

Paper ID- 726

IMPROVING ORGANIZATIONAL KNOWLEDGE CONTROL WITH THE USE OF NLP

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Knowledge management has emerged as a key enabler of organisational learning and innovation in the digital era. Over Data helps organizations to collect, transform and act upon these insights towards process innovation and decision victory. Rooted in a dynamic capability lens of organizational learning, this study extends theory and practice by illustrating how knowledge management systems, powered by NLP, can provide transformational impact in terms of guiding organizational learning to achieve competitive advantage in the midst of evolving business scopes. Failure to capture, share and innovate organizational learning allows an organisation to learn from its best practices and adequately adapt to change. Traditional KM approaches have been biased to the codification of explicit knowledge which, by and large, have focused on the codification of explicit knowledge, in general, they did not pay much attention to tacit knowledge embedded in extracted information from the organization communication, documents, and external data stores. NLP technologies help fill this vacuum by enabling organizations to work with both structured and unstructured data in a manner capable of uncovering previously opaque patterns.

Keywords: Knowledge management, Natural Language Processing, organizational learning, data analysis, unstructured data, sentiment analysis, entity recognition, topic modelling, adaptive learning, ethical challenges

Paper ID- 780

REINFORCEMENT LEARNING-BASED DYNAMIC BRAND DEFENSE TECHNIQUES IN AD NETWORKS

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With all of this possible and present in October 2023, we ask in such a competitive digital advertising environment who do brands lose sleep over and who are the biggest threats? In a rapid-fire world, these challenges are only accelerated online where new threats and opportunities emerge at the speed of light. To mitigate the harms, agencies must develop agile, real-time defense mechanisms that are designed with the flexibility to respond adequately to the dynamic marketing landscape. One branch of machine learning that reaches out for us, offering a potentially powerful tool to solve these issues, is Reinforcement Learning, with the potential to enable brand systems to learn the most effective strategy for defense, by interacting with the environment. We investigate reinforcement learning for dynamic brand defense in ad networks in this paper. Attention to Social Network In the proposed framework, RL represented the social network using GNN to create justifiable advertising. In this point of view we structure that the brands.

Keywords: reinforcement learning, ad networks, brand defense, click fraud, brand impersonation, machine learning, fraud detection, dynamic defense, cybersecurity, adaptive strategies

Paper ID- 785

STRENGTHENING ACQUIRING KNOWLEDGE FOR OPTIMIZING DYNAMIC DELIVERY ROUTES

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One of the most important challenges for delivery networks in logistics is the dynamic route optimization problem, which becomes increasingly important over time given the complexity of real-time constraints, such as traffic and road conditions, as well as order and customer demand. In general, conventional route optimization techniques such as static algorithms or heuristic approaches cannot respond to these changing landscapes, resulting in non-optimal solutions. Recently, Reinforcement Learning has become a potential candidate to tackle this problem, due to its ability to learn from interaction within the environment and improve decisions progressively. The soundness of RL approaches used in developing quasi-optimal dynamic routes provides an opportunity to optimize route plans, enhance efficiency, reduce operational costs, and further improve service quality in delivery networks. Reinforcement learning is actually a subfield of machine learning in which an agent learns to behave in an environment, in avow to maximize the long-term expected cumulative

Keywords*:* dynamic route optimization, reinforcement learning, delivery networks, real-time data, traffic conditions, machine learning, Q-learning, Deep Q-Networks, Actor-Critic algorithms, operational costs

Paper ID- 801

INITIATION AND TEMPERATURE DEPENDENCE OF DC ELECTRICAL TREE IN SILICONE RUBBER TO MINIMIZE POLARITY DEFECTS

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This article looked into flexible rubber's electrically bush commencement performance when exposed to voltages. The influence of temperature, defects type, and voltages reversal on electrically tree start were investigated via experimentation. We discover that the averaged tree commencement power loss dramatically with warming climate in samples with an intact catheter. Both single- and numerous different trees are seen. With rising temperatures, fewer numerous different trees are likely to form. In examples when there is an unbridgeable gap or syringe fracture, it is of that. As global temperatures for specimens under low polarity, it does not vary year by year and only fluctuates in limited selection specimens under voltmeter. In sampling, this orientation effect is the opposite. Electromagnetic tree commencement performance at 60 ° c is explained by the vacuum tube theory as well as of electromagnetic disintegration. According to the findings of thermo gravimetric, fractional segments softening at hot altitude causes a decrease. A later formed tree will decrease to almost half of its usual level owing to electromagnetic trees that have already been developed within the wire or an air gap that has been caused by mechanical stress. The construction of insulating material may benefit from this knowledge.

Keywords: Electrical Tree, DC Power Supply, Silicone Rubber Defect, Polarity, Temperature Variability, N Samples and Gas Crack Effect.

Paper ID- 844

IOT-ENABLED SMART SYSTEM FOR PERSONALIZED HEALTH MANAGEMENT WITH SEMANTIC TECHNOLOGIES

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The current world could be a critical representation of the exceptionally speedy improvement of electronic and data innovation. Wellbeing frameworks are not exempt from the consistent changes happening within the industry. For analysts, specialists, and patients, all these modern innovations are opening up a world of unused potential and challenges. The Web of Things is one of the advances that has been brought into the healthcare industry with extraordinary guarantee. These days, a parcel of restorative contraptions and sensors are associated to the Web of Things, giving shoppers real-time control over their wellbeing and specialists the capacity to appropriately screen their patients' conditions from a separate. The failure to effectively coordinated approaching information from heterogeneous sources, share information collected viably and productively whereas keeping up its security and protection, extricate valuable data from this information utilizing proficient information examination apparatuses, and perform expressive and customized visualizations are right now hindering the effective accomplishment of tall quality in wellbeing care hone. We too present the SM-IoT stage, an cleverly, internet-of-things

Keywords: Platform, Semantic Technologies, Iot, Healthcare Monitoring, Personalized Health, Data Integration, Real-Time, Data Privacy, User Interface

Paper ID- 871

IMPROVED MULTILABEL LAND COVER IDENTIFICATION USING MACHINE LEARNING AND DATA ENHANCEMENT

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The categorization of arrive cover could be a burgeoning subject of think about in farther detecting. Conventional strategies generally concentrate on the pixel-based calculations that are incapable to handle high-resolution pictures viably, or on the less difficult single-label situation. In any case, the issue of multilabel arrive cover scene classification is still not well caught on. Indeed whereas convolutional neural systems and profound learning have appeared an extraordinary capacity to handle troublesome machine learning issues like picture classification, their execution is disillusioning when prepared with a little number of explained tests. This research proposes a information enlargement strategy which will significantly extend a little information set to gigantic extents in arrange to induce around this issue. Our tests on a multilabel adaptation of the UC Merced Arrive Utilize information set appear the guarantee of the proposed method, which accomplishes an F-score metric enhancement of over 6ove the state of the craftsmanship at this time. For multilabel arrive cover

Keywords: Deep Learning, Multilabel Land Cover Scene Categorization, Data Augmentation, Convolutional Neural Networks, Remote Sensing, Environmental Monitoring, Image Classification, CNN Architecture, Information Extraction, Geographic Information Systems

Paper ID- 875

ARBITRARY ORIENTATION 2-D UTILIZED TO RECONSTRUCT 3-D SPACE

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The efficiency of 3-D imagery reconstructions (IR) and mobility compensating (MC) processes can be considerably impacted by the constrained capturing range and also the necessity provides the good quality setup for improvement 2-D/3-D imaging register (IRN) approaches. Obstacle-filled diagnostic scanning situations with high subject mobility, such fetus in utero ultrasound, complicate the 3-D picture and volumetric reconstruction procedure. In this study, we describe a learning-based IRN technique that can forecast the 3-D rigid distortions of freely oriented 2-D picture slices in relation to a learnt classical atlas co-ordinate system. Register and classical alignment are carried out just using picture slice intensities; no activation of the spatial translation is needed. We use multilayer neural networks architecture to develop a predictive function that can translate 2-D picture segments to a 3-D normative atlas area in order to detect image alterations. We carefully on synthetic magnetism resonance imagery (MRI), fetal brains image with synthesized motion, and genuine fetal MRI information where our technique is included into a full restoration and MC pipeline, assess the efficiency of our approach objectively. We also exhibit qualitative outcomes. Using simulated information, our attempting to learn registrations generates qualitatively enhanced reconstructions for actively moving infants with stages of pregnancy of roughly 20 weeks, with only an overall spatial posterior probability of 7 mm. Our method is appropriate for real life scenarios and offers a broad and economically

Keywords: image registration, image reconstruction, motion compensation, machine learning, magnetic resonance imaging, Biomedical imaging.

Paper ID- 888

SOFT COMPUTING BASED FINGER VEIN APPROVAL USING DIGITAL IMAGE PROCESSING FILTER

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The brain of humans is able to recognise and distinguish things in a photo with ease. The goal of artificial intelligence (AI) is to emulate or imitate how humans see going forward. Exposure to private information were restricted, therefore security has been preserved using fingertip vein-based identification of users. The poor accuracy of obtained photos due to irregular lighting, detector excellence, positioning deviations, and outside influences are the key problems in the hand vein inspection procedure. In the next section, we applied the Wiener filter to better the appeal of the photographs of thumb veins. Those devoid of noise photographs are offered for teaching the well-liked, had trained ConvNet topology used for thumb vein fingerprint user authentication. subsequently, in order to protect sensitive information and uphold silence, we evaluated the effectiveness of ConvNet algorithms (convolutional neural networks), which are names that include Alex Internet, Compression Net, Alphabet

Keywords: Finger Vein Authentication, Transfer Learning, Convolutional Neural Network, Accuracy
Paper ID- 927

IMPLEMENTATION OF GM METHOD IN AI3DCE

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This methodology applies an optimal stochastic solution to a virtual combat in a computational search and aims to have a machine that can be able to change its judgment call characteristics quickly to evolve its performances to a better level against even a good opponent. To turn around and see the result, an Endogenous switching proxy models use Connectionist temporal Probabilistic is learn on the fly to generalizing a data; predicting an unexplored area of the vector space, the globe. [potentially] Gaining a really similar effect as [1] allowing super valuable advice for future forecast improvements, and allowing the teacher engine to explore some representative metrics across hyperparameters, probably improving its efficiency. For Probabilistic implementations but courve — compatible workflow you are not be able to find globe optimum from scratch beacause you do not have a substitute model due to very different conditions and complicated criteria. New continuous measures of speech in different variation patterns (types of MSP) are provided to overcome these problems in the construction

Keywords: Gaussian Minimization, AI, Forecasting, Endogenous Switching Proxy Models, Data Analysis, MI, APID Development, Gauss Method, Fuzzy – Inference Algorithm, Bayesian Optimization and Genetic Optimization.

Paper ID- 939

BIG DATA UTILIZATION FOR DISEASE FORECASTING FROM MEDICAL TREATMENT ORGANIZATIONS

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Actual medical data analysis helps with slightly earlier illness diagnosis, patient treatment, and outreach programs as big data usage increases in the biological and hospitality industries. Notwithstanding, when the quality of the healthcare records is lacking, the analysis's precision suffers. Additionally, distinctive illnesses in various areas have their own traits, which could make it harder to forecast when an ailment will spread. In this study, we simplify machine learning methods for accurate noncommunicable diseases epidemic forecast in areas with high cancer incidence. We test the updated predictive model using data from actual hospitals in Sichuan Province. We employ a latent component model to fill in the blanks in order to get around the problem of insufficient data. We conduct research on a localized, persistent brain ischemia condition. Utilizing both structured and unorganized medical data, we suggest a novel comprehensive disease estimation method that utilizes convolutional neural networks. To the best of our understanding, no work has been done in the field of medical big data analytics that

Keywords: Big data, Disease forecasting, medical data analysis, Noncommunicable diseases, Epidemic forecast, Cancer incidence, Machine learning methods, Brain ischemia, Convolutional neural networks, Forecast precision, Monotonic cancer risk prognosis tool.

Paper ID- 965

AI EMPOWERED ECG'S FOR PROGNOSIS OF CARDIOVASCULAR CONTRACTILE BROKENNESS (CCD)

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Coronary conduit illness is a significant overall medical problem, adding essentially to passings and incapacity. Cardiovascular contractile brokenness (CCD) is a significant reason for coronary conduit illness, underlining the need of brief acknowledgment for fruitful treatment or evasion. While electrocardiograms, are every now and again utilized for CCD determination, their precision is confined, and non-specialists might battle with translation. Man-made consciousness (man-made intelligence) has showed huge expected in working on the precision and adequacy of ECG understanding. This survey of the writing sees enhancements in utilizing Al-empowered ECG for CCD appraisal, including profound learning, AI, brain network procedures, and Electrocardiogram-based Man-made reasoning methodologies. The review inspects the frameworks' benefits and downsides, contrasting their accuracy with conventional ECG translation and assesses the opportunities for expansive clinical execution. The review explores the frameworks' benefits and downsides, contrasting their accuracy with conventional ECG interpretation and evaluating their true capacity for inescapable clinical execution. As per our discoveries, Al-empowered Electrocardiogram has a high

Keywords: Cardiovascular breakdown, testing, ECG, computer-based intelligence settings.

Paper ID- 972

PIFA ANTENNA DESIGN VIA PSC WITH FR4S

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In this work, we are simulating Novel PIFA antenna with platinum substrate in comparison with FR4 dielectrics material at 6 GHz frequency The study has two groups with 20 samples and a pre-test or G power of 80%. The innovative method for the PIFA Antenna was developed using HFSS software as well as the path of the finite element. They simulated the PIFA antenna to calculate the bandwidth. The comparative analysis of gain of PIFA antenna utilizing platinum substrate with that of FR4 substrate. It is analysed by HFSS software, where the gain of proposed antenna is found 80% with significance of 0.048. The Gain achieved from the Novel PIFA antenna with the FR4 substrate is improved over the PIFA antenna using a Platinum substrate.

Keywords: Novel antenna design, PIFA antenna, FR4 epoxy substrate, Gain, Platinum substrate, HFSS software, Bandwidth.

Paper ID- 31

INNOVATIVE TECHNOLOGICAL TRANSFORMATION IN MINING INDUSTRY: SUSTAINABLE OUTLOOK AND FUTURISTIC APPROACH

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Innovation is crucial in the mining industry for improving efficiency, reducing costs, and addressing social and environmental concerns. Technological advancements enable exploitation of new deposits in complex scenarios. This paper identifies current digital transformation and key technologies in the mining industry. And identifies Mining's future is being shaped by technological trends such as continuous mining, invisible zero-waste mining, electro mobility, and digital transformation (DT). To improve processes across the value chain, DT involves implementing technologies 4.0, such as automation, robotics, and remotization of activities for providing orientation points for future digital transformation processes. In this study is qualitative data is used from several Scopus based journal and conferences papers. This paper also includes technological challenges faced by mining industry. On behalf of several studies, we also explore few analyses and recommendations also for smooth running of mining industry.

Keywords: Innovation, Digital mining, Artificial Intelligence, Machine learning, digital twinning

Paper ID- 92

COMPARISON OF AN EQUIVALENT CIRCUIT AND DATA DRIVEN BATTERY MODEL FOR EV APPLICATIONS

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Both electric and hybrid vehicles (HEVs and EVs) employ high-voltage battery packs, so a robust and dependable battery management system (BMS) is required to ensure a vehicle's safe and dependable operation. For proper functioning of the BMS, battery state estimation is a key challenge. This paper presents an equivalent circuit and a data driven model, evaluating and contrasting their appropriateness in terms of accuracy as compared to an experimental battery. Furthermore, the state of charge (SOC) of the battery is estimated, first with the help of the 2RC equivalent circuit model (ECM), then with the help of an artificial neural network (ANN). A pulsed discharge test is carried out and the SOC and voltage values are noted. The parameters of the 2RC model are tuned for improving the accuracy. The model with different parameters is compared with an experimental battery. With the data driven model, a better accuracy is achieved in comparison with experimental data. With the ANN the mean square error (MSE) of 0.8715% is achieved, whereas with the ECM an MSE of 2.87% is achieved.

Keywords—Lithium-ion battery, state estimation, Equivalent circuit Model, Data Driven Model

Paper ID- 96

COMPARATIVE ANALYSIS OF ELECTRIC CAR PERFORMANCE USING MATLAB SIMULATION

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Electric cars (ECs) have emerged as a possible response to rising environmental concerns and the depletion of fossil resources. Rapid improvements in ECs technology have inspired an increasing interest in understanding their performance and capacities as environmentally benign forms of transportation. As the demand for electric cars increases, researchers and engineers constantly research various modelling methodologies to improve their design and performance. One such method is to utilize MATLAB, a robust software platform extensively used to study and simulate electric car systems. In this study, we show a detailed MATLAB simulation of a four-wheeled electric car and examine several aspects of its design and performance. In this study, we modelled electric cars powered by PMDC (Permanganate DC motor) and WFDC (Wound field DC motor) motors and briefly compared the state of charge (SOC) and distance covered by vehicles in different case studies. After conducting a comparative investigation, it was discovered that the PMDC motors used in electric automobiles outperformed the WFDC motors.

Keywords: Electriccars, PMD Cmotor, WFD Cmotor,MATLAB, Drive cycle

Paper ID- 193

SYNTHESIS AND CONTROL OF DYNAMIC VIRTUAL INERTIA FOR MICROGRID SYSTEM APPLICATIONS

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During the last two decades, interest in grid integrated renewable energy sources (RERs) into the electrical power grids has significantly grown. The motive being a promising strategy to reduce greenhouse gas emissions generated by conventional power plants (CPPs) and hence environmental consequences, decrease losses in distribution lines to improve power system supply efficiency and reliability to consumers. As a result, several CPPs are being replaced by RERs such as solar PV system, wind energy, micro hydro-turbine, fuel cell, and small gas power plants. These are installed close to customers on low-voltage and medium-voltage sites to reduce losses in the network and improve power quality, overall efficiency and reliability. However, grid-connected RERs via inverter decreases system inertia due to decrease in CPPs with rotating mass serving as an immediate natural response to frequency deviations following network disturbances. Therefore, this paper presents the design of dynamic virtual-inertia control (DVIC) scheme. The developed DVIC incorporates the mechanism to adjust active and reactive demand in response to any frequency and voltage variations to ensure system stability. To validate the suitability of the presented technique, MATLAB/Simulink model is developed and simulated under various operating scenarios. Using the results obtained simulation study, it is evidently the proposed DVIC shows improved performance is achieved than when no inertia control system applied.

Keywords—Frequency deviation, Microgrids, Renewable energy resources, and virtual inertia control.

Paper ID- 208

PERFORMANCE ANALYSIS OF BLDC MOTORS FOR FLYWHEEL ENERGY STORAGE APPLICATIONS WITH NONMAGNETIC VS. MAGNETIC CORE STATOR USING FINITE ELEMENT TIME STEPPING METHOD.

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This paper presents a comparative performance analysis for selecting high-speed and efficient Brushless DC (BLDC) motors, with a focus on different stator core materials suitable for applications such as flywheel energy storage systems and servomotos. Traditionally, motor design and selection are performed through computational analysis using Finite Element Analysis (FEA) tools prior to implementation. However, to gain a deeper understanding of performance parameters for specific applications, this study employs a circuit field coupled Finite Element Method (FEM) analysis in the time domain to investigate the dynamic performance of BLDC motors equipped with non-magnetic and magnetic stator core materials. Preliminary results reveal significant differences in motor efficiency, torque production, and electromagnetic properties between the two configurations. The findings high light the potential benefits of using non-magnetic materials in BLDC motors for flywheel applications offering advantages in terms of efficiency, weight reduction, and cost-effectiveness.

Keywords—Finite element time stepping method, High speedBLDC motor, Flywheel energy storage system.

Paper ID- 355

COMPARATIVE ANALYSIS OF SOLID-STATE MARX GENERATOR CONFIGURATIONS FOR ENHANCED HIGH-VOLTAGE PULSE PERFORMANCE

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This paper presents a comparative study of various configurations of solid-state Marx (SSM) generators, focusing on performance enhancements through specific modifications. Traditional Marx generators use capacitors, resistors, and switches to generate high-voltage pulses without pulse transformers. The advent of solid-state switches has led to more compact and versatile designs. This study investigates five SSM configurations: a basic SSM generator and versions modified with inductors, Boost-Marx, Buck-Boost, and a two-group capacitor approach. Simulations conducted using MATLAB Simulink demonstrate the impact of the modifications on output voltage characteristics for input voltages ranging from 200Vto1400V, across 4, 8, and 12-module setups. Results indicate that the Boost-Marx modification consistently produces the highest voltage spikes with a linear increase in output, while the inductor-modified configuration shows less predictability. The Buck-Boost and the two-group capacitor modifications offer varying advantages depending on the number of modules and specific application requirements. The findings highlight the trade-offs between predictability, component usage, and voltage performance, providing insights for selecting the optimal SSM configuration for diverse industrial applications.

Keywords—Boost-Marx,Buck-Boost,high-voltagepulses,Marx generator, solid-state, two-group capacitor.

Paper ID- 469

INTEGRATIVE OPTIMIZATION FRAMEWORK FOR STRATEGIC DISTRIBUTED GENERATION PLACEMENT AND SIZING TO ENHANCE LOSS MINIMIZATION AND VOLTAGE STABILITY IN POWER DISTRIBUTION NETWORKS

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The location and scale of distributed generation (DG) units are critical for minimizing losses and enhancing the performance of distribution networks. This research establishes the optimization approach for establishing the optimal location of the dg, especially solar PV and wind turbines using the IEEE 37-bus system as the test feeder. Having this in mind, this work applied a unified approach based on Panda power, a versatile Python-based power systems tool, combining optimization and power flow computations. The algorithm analyzes a range of DG technologies and penetration levels to determine the effectiveness of decreasing loss, considering variability in renewable generation and load demand to increase realism. The single-tool forms presented in the paper show practical application potential and offer a better understanding of the best approaches to DG integration that would benefit grid stability and energy efficiency in the distribution networks of the future.

Keywords—Distributed Generation, Power Loss Reduction, IEEE 37-Bus System, Renewable Energy Uncertainty, Single-Tool Optimization.

Paper ID- 471

ADVANCED SPATIOTEMPORAL ANOMALY DETECTION IN PHOTOVOLTAIC POWER PLANTS USING TEMPORAL GRAPH NETWORKS INTEGRATED WITH PUBLICLY AVAILABLE WEATHER DATA

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For purposes of performance analysis and minimization of maintenance expenses, it is vital to identify an effective way in which to monitor anomalies in photovoltaic (PV) power plants. This paper proposes a novel framework to address the problem of anomaly detection based on the inherent graph structure of PV plant configurations using Temporal Graph Networks (TGNs). TGNs are built to capture spatial and temporal dependencies of the PV systems which allows detecting discrepancies affecting the power production, which traditional NN might fail not to notice. The model uses external weather data collected from NOAA and tracks how external parameters influence the performance of photovoltaic panels and therefore electricity generation. Our methodology solely employs TGNs to analyse the intricate relationship in the PV plant data to improve the recognition of abnormality associated with the equipment and weather conditions. The integration of NOAA's open source weather data into the extent of analysis further raises sophistication by offering a variety of features and conditions affecting PV results. Our approach achieves high accuracy of anomaly detection and can be considered to be better compared with the baselines that do not take graph dependencies or time aspect into account. This advancement has important implications for enhancing the operation and maintenance recommendations in the PV power plants and hence the reliability of the satellite power systems. Allying our efforts to one highly specialized method, this research presents a new state of the art in leveraging centralized data for anomaly detection in renewable energy.

Keywords—Temporal Graph Networks, Anomaly Detection, Photovoltaic Power Plants, Weather Data Integration, Solar Energy Efficiency**.**
Paper ID- 472

PROBABILISTIC MODELING AND UNCERTAINTY QUANTIFICATION OF HARMONIC DISTORTIONS IN GRID-INTEGRATED INVERTERS THROUGH BAYESIAN NEURAL NETWORKS

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Harmonic distortion in grid connected inverters Thus, impacts on power quality and system stability are high, and more especially for systems that use renewable energy sources. This research presents a new stochastic predictive modelling approach based on Bayesian Neural Networks for forecasting of harmonic distortions with prediction uncertainty. The proposed methodology uses data from the National Renewable Energy Laboratory (NREL) database that consists of detailed grid voltage, current under various REMs. Harmonics components derived via sophisticated signal processing algorithms then yields the desired data base for training and testing. The uncertainty of grid conditions can be modelled by means of probabilities due to the utilization of BNNs for improving the reliability of predictions. The combination of stochastic modelling and harmonic analysis in this work creates a complex approach to enhancing grid stability and power quality. As applied to renewable energy challenges, the common method enhances the proposed approach as a scalable and adaptive solution for the mitigation of harmonic impacts for future power systems.

Keywords— Harmonic Prediction, Bayesian Neural Networks, Grid-Connected Inverters, Stochastic Modelling, Renewable Energy Integration.

Paper ID- 506

REINFORCEMENT LEARNING-DRIVEN AUTONOMOUS OPTIMIZATION OF MULTI-PARAMETER POWER EFFICIENCY IN HIGH-DIMENSIONAL VLSI CIRCUIT DESIGN ARCHITECTURES

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The study focuses on the use of one RL method to minimize power consumption in VLSI circuits. In this paper, the RL model is trained with DQN algorithm where the VLSI circuit design is optimized in terms of power consumption by controlling certain parameters without compromising performance. The RL agent communicates with a developed simulated environment utilizing open-source VLSI design tools in order to utilize the DQNs optimization capability in design spaces that are dynamic. It is important to point out that the entire process of power consumption forecasting, utilizing the proposed architecture, is validated using a single, standardized power consumption dataset. TensorFlow is used for modeling while simulating and validating the circuits would require Magic VLSI tool. This approach has shown the usage of the RL-based optimization for arriving energy-efficient the VLSI design.

Keywords- Deep Q-Network, power optimization, VLSI circuits, Magic VLSI, reinforcement learning.

Paper ID- 523

ADAPTIVE REINFORCEMENT LEARNING FRAMEWORK FOR OPTIMIZED ENERGY MANAGEMENT IN HYBRID ELECTRIC VEHICLES USING SYNTHETIC DRIVING ENVIRONMENTS AND OPEN-SOURCE SIMULATION MODELS

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Conventional heuristic approaches are sometimes used to model energy management strategies for HEVs, especially for Rule-Based car models, but RL is the solution that presents a shift in strategy. In this research, RL is used to solve the problem of M/M objectives in the field of HEVs by optimizing fuel efficiency and emissions. Based on the realistic synthetic driving cycles that mimic various realistic driving scenarios, and the open-source toolbox Open PowertrainLib, the research develops a reproducible and computationally saving approach. I have suggested that the powertrain energy distribution should be trained through reinforcement learning (RL), PPO, a policy-gradient-based RL algorithm should be used to propose an agent capable for adaptive control. When it comes to implement the maneuverer the dynamics of the hybrid vehicle as well as the constraints of the powertrain are modelled within the 'Open PowertrainLib', which provides credible and reconstructive looks at the maneuverer under simulation. The simulations show a remarkable increase in energy efficiency and emissions decrease in comparison with conventional heuristic methods. This work helps towards sustainable transportation by demonstrating the promise of RL-driven intelligent energy management systems of HEVs.

Keywords—Hybrid Electric Vehicle, Reinforcement Learning, Energy Management Optimization, Synthetic Driving Cycles, OpenPowertrainLib.

Paper ID- 526

DISTRIBUTED REINFORCEMENT LEARNING FRAMEWORK FOR COLLABORATIVE ENERGY MANAGEMENT IN CONNECTED HYBRID ELECTRIC VEHICLE ECOSYSTEMS

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The technical parameters of HEV energy management systems increase in interaction with connected and dynamic environments, therefore demanding superior control algorithms. This work proposes an asynchronous RL paradigm for energy management in driving HEV ecosystems. The framework uses distributed RL agents with each agent responsible for local policy optimization for energy control of individual electric vehicle and with sharing information through V2V and V2I mechanisms. A general optimization layer superposes local data to coordinate personal interests with global objectives, for example, the general level of emissions and traffic density. The proposed method is capable of effectively mitigating the periodic decision making issue through using high accuracy RL algorithms for instance the MAPPO alongside low latency communication. OpenPowertrainLib and SUMO are utilized for traffic modelling integrating stochastic traffic characteristics and renewable energy inputs as well as complicated vehicle dynamics. Research findings establish the efficiency in terms of energy savings and emissions compared to single optimized energy management solutions as well as improved traffic flow. The research puts emphasis on distributed RL frameworks in developing intelligent transportation systems that positively impact scalability and sustainability of connected HEV networks. This study sets the ground for potential future developments in co-energy management and its incorporation into smart cities.

Paper ID- 684

AN OVERVIEW OF ML TECHNIQUES FOR TIMELY RECOGNITION OF VOICE MALADIES

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Humans have an astounding ability to control loudness and tone through their complex voice production system. The vocal cords are vulnerable to damage from both internal and external factors, which can alter a person's voice. Both the physiological and psychological aspects of the body are impacted by these changes. To help patients cope with potential consequences and enhance their quality of life, it is crucial to quickly identify any changes in voice quality. Considering that this substantially improves our understanding of these disorders, it is imperative that machine learning methodologies be applied to automatically diagnose voice abnormalities. Computational strategies to aid clinicians in the early diagnosis of speech anomalies have been the attention of many investigations in recent years. An exhaustive assessment of previous work in the area is the goal of this project, which will target in on automated voice disorder identification.

Paper ID- 709

THE IMPLEMENTATION AND INTEGRATION OF AI IN THE FIELD OF SM

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Hence, this paper focuses on the aects of ARTIFICIAL INTELLIGENCE on discipline of STRATEGIC MANAGEMENT. As the world keeps advancing, so does AI technology, and companies are investing in AI-driven systems to make better strategic decisions. It presents a discussion of the primary ideas in AI and strategic management, underlining the advantages and difficulties of utilizing these intelligent technologies in strategic management and decision-making. It takes stock of the respective literature on the subject and explains the ways that AI can be used across different strategic management contexts like risk management, competitive intelligence, and innovation. The article discusses the organizational and ethical implications of AI in strategic management, including data privacy issues and job displacement risks. Summary of the study, AIs could actually help improve the efficiency and effectiveness of decision-making at the strategic level, but ultimately, their use is contingent upon an exhaustive examination of the organizational and moral

Paper ID- 722

AI-POWERED BUSINESS ADMINISTRATION EVALUATION OF RISK MODELS

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So to reveal the meaning of really working in the warp of the fastest changing enterprise you can start to click the following next spaces in future websites. It's because many traditional risk assessment models, while good at what they do, are often ill equipped to accurately source upon and analyze the types of dynamic, expansive and unstructured data sets that are commonplace in a modern enterprise. In this brief article we introduce a emerging application of AI-driven risk assessment models that builds on the Transformer architectures (e.g., BERT, GPT and their domain-specific adaptations) to overcome such challenges. Initially created for Natural Language Processing, these powerful models have now achieved state-of-the-art performance across a remarkably broad range of disciplines through previously unimaginable levels of contextual understanding, data

synthesis and pattern recognition across multiple data-types. This paradigm shift can be attributed to handicap self-attention mechanisms followed by transformers — architectures in a position to grip through

Paper ID- 739

BLOCKCHAIN FOR SAFE CREDENTIAL CHECKING IN HIRING

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These challenges were further amplified in recent years, causing recruitment processes to be more transparent in aspects like education, work experience, and professional verification. Traditional methods of validating credentials — contacting institutions or employers directly can be time-consuming, mistake-prone and susceptible to fraud. Blockchain technology offers a solution that can assist in the digitization of credential verification, enabling employers to rapidly and securely verify a candidate's credentials. This paper explores blockchain use in talent acquisition and verification of credentials, highlighting its game-changing potential for the hiring process. Blockchain is a distributed and immutable digital ledger in which data cannot be altered once it has been entered, providing a high degree of trust and transparency. Blockchain technology enables educational institutions, employers and other credentialing bodies to issue verified digital credentials that are securely stored and can be easily presented to employers. One of the emerging trends is Verified CVs verified on blockchain based solutions, candidates can represent their validated qualifications on

Paper ID- 761

DESIGN OF A CONTROLLER FOR STATE OF CHARGE REGULATION IN BATTERY-SUPERCAPACITOR SYSTEMS CC- CV CHARGING WITH MODIFIED PASSIVE TOPOLOGY

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This study proposes enhancing the usage of passive topology for hybrid energy storage systems (HESS) in electric vehicles (EVs), addressing the limitations of conventional designs through an enhanced state of charge (SOC) regulation controller. The system prioritizes sequential charging of the super capacitor and battery, overcoming issues of undercharging and limited flexibility in the existing system. The work focuses on the effect of the proposed controller for Constant Current and Constant Voltage (CC-CV) charging on the modified passive topology. The Proposed system is validated using the dSPACE RTI 1202 MicroLab Box, ensuring precise SOC regulation and efficient operation. The comparative analysis highlights the enhanced flexibility and reliability of the proposed approach, optimizing HESS performance for EV charging applications. This advancement in passive topology design offers significant potential for improving energy storage efficiency in EVs.

Paper ID- 769

RFID AND BLOCKCHAIN FOR SYSTEMS OF PRODUCT AUTHENTICATION

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The issue of counterfeit products is real, and is potentially dangerous to industries, economies, and consumers the world over in this new era of globalization and digitalisation. Traditional product authentication system is usually failed to protect securely, transparent and efficiently and become victims of forgery and fraud. In this paper, we propose a decentralized product authentication scheme based on Internet of Things, Radio Frequency Identification, and blockchain. This paper presents a robust tamper-proof decentralized authentication for products across different industrial domains, by integrating the strengths of these technologies. So, the IoT enables this ecosystem by providing infrastructure to collect data 24/7 and communicate between devices with ease. These RFID tags carry unique identification information that allows for precise tracking and verification at all stages of the product lifecycle. These types of tags also allow for automatic data capture with zero need for human intervention, greatly reducing human error rates while optimizing supply chain processes. The combination of IoT in RFID itself cannot address several security issues such as data tampering

Paper ID- 796

SUBTITLING OF CROWD SENSITIVE NOISE AND VIBRATION DATA USING CLOUD COMPUTING

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In a brand-new paradigm known as edge computing, significant storage and processing capabilities are moved closer to mobile smartphones and other edge-connected devices connected to the internet. Edge computing has been a viable area for academics, businesspeople, and researchers in recent years. A community sensor network architecture that already exists has been improved in this study with edge support to increase the accuracy of mobile crowdsourcing data for monitoring the environmental contexts like traffic excessive noise. To forecast more precise contextual trends, it might be difficult to determine the credibility of data gathered in participatory environments. By removing the erroneous data at the edge nodes, the proposed approach may be able to provide results that are more accurate. In addition to achieving quicker reaction times for providing services on demand in comparison to prior framework implementation, it greatly reduces the amount of data. Utilizing the suggested edge-based community

Paper ID- 805

RISE OF DIVERSITY OF INTERNET OF THINGS (IoT) : A REVIEW

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It has been established for a long time and has evolved correspondingly that actuators and sensor systems may be connected to the internet for the purpose of continuously monitoring and controlling biological phenomena. The term "Internet of Things (IoT)" was first used to combine these methods into a coherent framework a little more than a decade earlier. The IoT based idea has evolved along with science, adopting new vocabulary that is suited for technical advancements and many applications sectors. The IoT has undergone modifications since its

inception, and this study examines studies on how technical advancements have transformed it as well and encouraged the emergence of modified terms appropriate for certain fields. A three separate study of the literature was done using games companies and classification data warehouses. First step involved looking for proposed changes on the Iot devices principle & evaluating them to compute the similarity, disparities, and functionality that enable us to generate a number of links its progression. The 1st step involved identifying and briefly assessing the much more common names handed to it IoT for multiple areas. As underpinning innovation continues to advance and software update areas are

Paper ID- 813

OPTIMIZING CROP MANUFACTURING: COMBINING IOT, SMART TECHNOLOGY, AND INFORMATION MINING FOR SUSTAINABLE

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Additionally, technical advancements have been created that take use of the internet of things to increase the productivity, cost-effectiveness, and efficiency of resource usage in agricultural production systems—particularly in light of the present climate change situation. These days, the demand for food is rising due to climate change and an expanding global population. Given the significance of the aforementioned concerns, the paper's synopsis focuses on smart methodologies and contemporary IoT ways to support sustainable agricultural production. The findings also highlight the advantages of implementing smart, effective, and resource-efficient agricultural systems via the use of contemporary IoT technology and clever inventions. In addition to helping to maintain production in the face of resource constraints, modern technology supports data management in agricultural systems, climatic variation observation, soil nutrient monitoring, and water dynamics monitoring. Additionally, managing diseases, pests, and insects is aided by modern technology. To ensure the possibility of making choices in a timely manner, a wide range of sensors and computer tools may be used for cropping system management and data recording. Thus, advancements in

Paper ID- 823

AI INTEGRATION IN FI AND VSC TECHNOLOGIES

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The authors looked at several types of AI, how it works with the food value and supply chain, other AI-using technologies, adoption barriers for AI in different contexts, and solutions for overcoming these barriers. This is because it illustrates how artificial intelligence's wide range of applications creates opportunities for vertical integration across the food supply and value chain. It affects the many stages of the chain in developing technologies. The methods by which artificial intelligence interacts with other technologies are demonstrated by a systematic literature analysis. These technologies include big data mining, machine learning, the Internet of services, agribots, industrial robots, sensors, drones, digital platforms, driverless cars and machinery, and nanotechnology. They also assign distinct capabilities to various phases of the technology. However, a variety of social, technical, and financial obstacles affect how it is used. However, these obstacles may be overcome by raising the farmers' level of financial and digital literacy and sharing best practices with all parties involved in the food supply and value chain. Artificial intelligence has tremendously changed the way food value and supply chain looked once. Therefore, a seismic move in the production, distribution, processing, or consumption of food has happened. The salient review of the role of AI through the food supply chain shows how it can be efficient, waste-free, and avert crises. AI-driven agricultural technologies, including predictive analytic and precision farming tools, help farmers control pests, sow more effectively, and

Paper ID- 848

A SYSTEMATIC REVIEW ON S TECHNOLOGY IMPLEMENTATION FOR DAHC

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Oxford and Kaiser Permanente, a US healthcare supplier, collaborated to form the primary compelling utilize of semantic innovation for the examination of healthcare information. Each year, US HMOs are required to supply US specialists with estimation discoveries relating to the quality of care. A famously troublesome standard known as HEDIS characterizes one of these sets of measures for information investigators. frameworks made utilizing SAS programs or SQL questions result in complex frameworks that require a critical venture of time and money for approval and upkeep. We appear the consider whereby we computed the foremost challenging component of the HEDIS estimations utilizing semantic advances. We illustrate how we encode HEDIS within the RDF-triple store RDFox run the show dialect in a clear, organized, and readable manner. We compute and extricate the comes about utilizing

Paper ID- 852

SEMANTIC WEB FRAMEWORK FOR AUTOMATED SMART ASSISTANTS IN PUBLIC HEALTH

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In reality, the COVID-19 widespread illustrated that information frameworks will play a significant part in giving precise data when it comes to displaying actualities to individuals with shifting foundations and get to to innovation. On the one hand, open wellbeing organizations and organizations are deferring the broad sending of virtual associates due to deterrents and confinements. This article presents Moment Master, an open-source semantic web system that can be utilized to plan and coordinated voice-activated shrewd associates on any online stage, in any case of the space or innovation being utilized. This portion encourages the simple integration of an operable right hand with non-technical space experts' websites, separating the assistant's capacity to tune in and react to voice enlightening. As an enlightening asset for the framework, Moment Master is self-acting when it comes to parsing and handling As often as possible Inquired Questions destinations. It too communicates with a farther information motor to supply ontology-powered induction and the energetic utilization of information. In order to empower

Paper ID- 858

METAVERSE AND GLOBAL SECURITY: NAVIGATING EMERGING AND DISRUPTIVE TECHNOLOGIES

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The metaverse, therefore, will be critically analyzed as a case of a disruptive, emergent technology and the potential implications it can have in the context of international security. The final section will concentrate on the social and relational dimensions of the metaverse—considering the military, asymmetrical risks like terrorism and laundering in the darkverse, and quotidian life. These are just three examples of how applications

may influence the metaverse. The metaverse, afteru00a0the pros and cons that future this emerging kind of the metaverse apart, represents the newly emerging and converging domain of Augmented Reality, u00a0Virtual Reality and Blockchain technology. The metaverse is considered a persistent, digital, immersive and interactive environment that expands beyond the barriers of the physical

Paper ID- 879

MODELLING AND EVALUATION OF THE CLOUD HEALTHCARE SYSTEM FOR INITIAL AID AND DEPLOYMENT SYSTEM

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Modern times have never seen such a dire need for advanced medical treatment, since the world's population is rapidly ageing. Numerous intelligent wristbands that can rapidly determine the physical status of seniors have emerged in the field of geriatric health. It can alert the medical network at the hospital or the family member's mobile phone whenever an abnormal event arises and intervention is necessary. The health care facility will then dispatch a medical truck together with the required professionals to rescue the distressed person. The first wristband sensors that collect information on rescue behaviour throughout the entire process are the main subject of this investigation. Additionally, it provides a Petri network theory of distributed resource distribution based on online health care systems. The case study illustrates how a model is able to identify a perfect scheduling the road as well as how every element of its framework can respond appropriately. The structural analysis of the simulation and its creation of the algorithm confirm the logic as well as efficacy of the whole system model.

Paper ID- 980

METAHEURISTICS FOR AUTOMATING PERFORMANCE MEASUREMENT IN MANAGEMENT

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The "metaverse" is a novel concept that imagines a fully immersive virtual world where users can interact, communicate, and conduct business. The "metaverse" is an idea that represents the most immersive type of virtual world, one in which we can interact and exchange information with others or do business. However, with the further development of and wider applications for the metaverse, its effects on both corporate culture and communication are expected to be increasingly felt. A: This is a research project to explore how the metaverse affects corporate communication and culture. From the literature review, it can be seen that the metaverse will change how businesses operate-it not only creates new remote work and virtual gatherings, but also encourages greater social engagement; teamwork; and communication. These findings are supported by a second study, which showed that the metaverse improved working culture and communication. These results

Paper ID- 989

ELECTRIC VEHICLES: TYPES, ADVANTAGES, DIFFICULTIES, AND POSSIBLE REMEDIES FOR BROAD ADOPTION: A REVIEW

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Due to the rise in fuel prices and the toxic emissions released by burning fossil fuels in traditional cars, the use of clean energy in the transportation sector has received a lot of attention during the past 20 years. Since they don't produce greenhouse gas emissions, electrical vehicles (EVs) could replace cars with internal combustion engines (ICEs). However, because to factors including low battery capacity, lengthy charging times, and a lack of infrastructure for charging, the automotive industry has been restricted to EVs with short range. The types, benefits, and challenges are covered in this article. The efforts made by different government agencies throughout the world to promote EV adoption are also covered, as are potential solutions for widespread adoption.

Paper ID- 992

EFFECT OF VARIOUS PARAMETERS ON THERMAL ENERGY TRANSFER PERFORMANCE OF HEAT PIPE

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The thermos physical characteristics of any operating medium are the key parameters for the effectiveness of heat pipes. An operating medium with good thermal conductivity, poor viscosity, and low surface energy (surface tension) is proven as a good heat transfer medium in heat pipes. Researchers have proved that nanofluids have a higher thermal conductivity in comparison to other operating mediums. In the present paper, the impact of different parameters on heat pipe effectiveness has been reviewed. Literature review shows that type of the working fluid, wick structure, filling ratio, and orientation has influenced performance of the heat pipes. Thus, heat pipe performance does not depend only on thermophysical properties but also on the wick structure, angle of tilt, and filling ratio. The pressure inside the heat pipe is also a key parameter for the evaporation of the working fluid. The quantity of vapor formation depends on the inside pressure also so it affects the effectiveness

Paper ID- 1031

LITERATURE REVIEW ON SRAM CELLS UNDER STABILITY, ENERGY, AND POWER CONSTRAINTS

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The increasing importance of power optimization in modern VLSI technology has made it a key focus in today's designs. Recently, static random-access memory (SRAM) has gained popularity due to its outstanding performance in VLSI design processes operating at submicron or nanoscale levels. Several SRAM cells have been developed to function efficiently at lower voltages with reduced quiescence. This paper presents a newly proposed 8T SRAM cell design that offers improved read and write stability compared to the 6T SRAM cell. To address power leakage, two PMOS transistors are added to both the read and write circuits. The proposed 8T SRAM cell shows a significant reduction in leakage current compared to the 6T SRAM. SRAM is the primary memory for small, cache-less embedded processors, driving the development of memory designs that optimize various process parameters such as energy, stability, and power constraints.

Paper ID- 11

AI-DRIVEN PERSONALIZATION IN EDUCATION

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In this paper, we delve into how different AI models, LLMs integrated into Learning Management Systems and e-Learning platforms can impact education. By looking at existing research and real-world data, we aim to understand how AI-driven personalization can make educational platforms work better. We're exploring a variety of AI techniques like machine learning, natural language processing (NLP), and deep learning, LLMs. These tools help tailor educational content, tests, and feedback to each student's unique needs. But we're also examining the challenges and opportunities that come with using AI in education, like privacy concerns, biases in algorithms, and making sure these systems can scale up effectively. We're also interested in what teachers and students think about using AI to personalize education. By doing surveys, interviews, and analysing how users interact with these systems, we can figure out how well they work and how they can be improved.

We're not just looking at one type of educational system either. So, our study looks at all these aspects to understand how AI can make education better for everyone, from kindergarten to professional training. We want to see how it can change teaching methods, what students learn, and how schools are run. Our models delve into the future by integrating Ai with existing education system which ultimately turn the need of private tuition down. Work on this field has been started after AI came into existence this could possibly be great invention by human beings. We have implemented this process for various but small edtech companies that exist near our geographical location. This could change the way of teaching in schools , home, colleges, university etc.

Paper ID- 21

A REAL-TIME OBJECT DETECTION SYSTEM WITH AUDIO FEEDBACK FOR VISUALLY IMPAIRED PERSONS

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Object detection technologies offer attractive possibilities to visually impaired persons enabling them to avoid full-on collision with obstacles and recognize objects. This paper represents modern real-time object detection system with integrated audio feedback is presented in this study in an effort to improve accessibility and situational awareness. The YOLO (You Only Look Once) algorithm is used by the system to efficiently recognize objects in images, videos, and real time object detection(WebCam) and the IDE we used is Jupyter Notebook . It is implemented with OpenCV. Our method combines visual and audio outputs by using text-to-speech technology to announce the presence of detected items while also showing bounding boxes and labels on them. The method exhibits great precision in distinguishing numerous objects in intricate settings, upholding a 0.5 confidence threshold to guarantee dependable identifications. Important features include threaded audio announcements to eliminate interface lag, dynamic label positioning for clear visual feedback, and non-maximum suppression to reduce overlapping detections. This multimodal method creates opportunities for applications in autonomous systems, augmented reality, and assistive technologies in addition to improving the interpretability of detection data. Our study advances computer vision by providing an integrated system that combines real-time auditory feedback with visual detection. This technology could help users who are visually impaired and improve human-computer interaction across a range of applications.

Paper ID- 25

TOPIC MODELLING USING TRANSFER LEARNING: ISSUES AND CHALLENGES

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Transfer learning is a machine learning technique that leverages knowledge gained from one task or domain to improve the performance of a related but different task or domain. Instead of training a model from scratch for the target task, transfer learning allows us to use pre-trained models that have been learned from a large and diverse dataset in the source domain. The knowledge and representations acquired by the pre-trained model can then be fine-tuned or transferred to the target task or domain, often with a smaller dataset. Topic modeling is a technique used in natural language processing (NLP) and machine learning to identify and extract the underlying themes or topics from a collection of documents or textual data. It is an unsupervised learning approach that aims to discover the hidden semantic structure within the text without prior knowledge of the topics. The primary objective of this paper is to explore the potential of transfer learning for topic modeling of text. Further, to evaluate the performance of the pre-trained model accuracy. The paper also describes the issues and challenges associated with the text for performing the topic modeling using transfer learning. This paper delves into the methodologies, and techniques of topic modeling using transfer learning. It explores how this novel approach transcends the constraints of conventional topic modeling, enabling the extraction of meaningful topics from data-rich source domains to improve topic modeling performance in data-scarce or specialized target domains. By integrating the principles of transfer learning into the topic modeling framework, we unlock the potential to enhance the interpretability, accuracy, and applicability of topic modeling across diverse domains and applications. this paper sheds light on the transformative power of transfer learning in the realm of topic modeling.

Paper ID- 26

DISEASE AND MEDICATIONS TEXT VISUALIZATION USING SCATTERTEXT

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Before text data can be analysed and visualised, it must be thoroughly cleaned due to its messy nature. data visualizations use the data to tell an engaging and simple-to-read story. That is what the Scattertext tool does. Scatter text, allows which terms stand out in your corpora and how their frequency varies across categories. The dataset used in this paper includes reviews of drugs. This dataset offers a useful window into how people discuss their thoughts and experiences using various drugs. The drug names, user ratings, and the actual written reviews are among the details included in the dataset. Reviews of drugs gathered from a variety of sources, representing a range of viewpoints and emotions, make up the dataset. Every entry in the dataset offers information about a user's experience with a particular medication, enabling us to investigate the emotions connected to various drugs. Decision-making in healthcare and pharmaceuticals can benefit greatly from an understanding of the opinions expressed in drug reviews. The distinction between points that are labelled and those that aren't is made using a special algorithm for Scattertext. Users can interactively see which terms correspond to which points by moving their cursor over the labeled areas done client-side.

Paper ID- 33

INVESTIGATING THE DYNAMICS OF NFT MARKETPLACES

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The rise of Non-Fungible Tokens (NFTs) has transformed the landscape of digital asset ownership, introducing new platforms for content creation and consumption. This research delves into the changing content dynamics within NFT marketplaces, focusing on the evolution of digital asset characteristics and consumer behavior. By studying established categories such as visual arts, music, and collectibles, we analyze shifts in demand patterns over time. Furthermore, we explore the significant impact of celebrities and social media influencers on specific NFT projects and broader market trends. While their involvement can generate interest, we critically assess potential drawbacks, including the susceptibility of hype-driven markets to fraudulent activities. Through data analysis, our goal is to shed light on the dynamic nature of NFT content, offering insights into its current status and future direction.

Paper ID- 69

PREDICTING BLOOD GLUCOSE LEVELS IN TYPE 1 DIABETES USING DEEP LEARNING AND REGRESSION TECHNIQUES

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Accurate blood glucose prediction is very critical for the effective management of Type 1 Diabetes as it allows timely interventions and prevents fluctuations in blood sugar levels. Due to such shortcomings, the traditional methods of monitoring that are followed are consistently unable to provide real-time insights and often cannot inform the patients about the stable levels of their glucose. This research studies advanced deep learning applications based on LSTM, GRU, ARIMA, and linear regression models to predict blood glucose levels in terms of insulin intake dosage, consumption of carbohydrates, level of physical activity, and sleep patterns. The model performances with respect to MAE, RMSE, MAPE, and accuracy are deployed for training and performance evaluation. Results were obtained, which show that LSTM performed well in comparison to others with an accuracy of 97.68%, followed by ARIMA (92.23%), GRU (91.23%), and Linear Regression at an accuracy of 89.45%. Real-time testing also gave the results consistent with the above, showing accuracy at close par with the glucose values. Therefore, LSTM in diabetes management systems may allow for blood glucose monitoring in real-time and customised intervention. This research contributes towards developing intelligent systems with the capacity to predict problems and enhance patient outcomes and quality of life for those with Type 1 Diabetes by embedding deep learning models into predictive accuracy and timeliness.

Paper ID- 70

AN ADVANCED COGNITIVE APPROACH FOR PERSONALIZED DRUG FORMULATION IN TYPE 2 DIABETES USING DEEP NEURAL NETWORKS AND FEATURE-BASED FUSION

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Personalized medicine is an innovative approach toward achieving improved therapeutic outcomes, notably in chronic diseases like Type 2 Diabetes (T2D), where individualised drug formulations represent the crux of treatment. Conventional methods of drug prescription tend to focus on generic approaches without considering the specific genetic, physiological, and lifestyle characteristics of individuals. This research fills this gap by developing an advanced deep learning-based method for personalised drug formulation in T2D. It integrates diverse patient data, including demographics, medical history, clinical measurements, genomic information, pharmacokinetic information, real-time monitoring data, and responses to previous treatments. For optimal drug formulation, it makes use of a combination of deep learning models, such as Recurrent Neural Network (RNN) for time-series prediction, Convolutional Neural Network (CNN) for genomic analysis, GAN for producing synthetic data, and auto-encoder for feature extraction. The dataset consists of 2700 patient records collected over one year, wherein the pre-processing phase includes handling missing values, normalising continuous variables, and encoding categorical features. Trained models were assessed based on precision, recall, F1-score, and AUC ROC levels; the best performance came from the RNN model with a maximum accuracy of 97.35%. CNN, GAN, and Autoencoder also obtained similar competitive results. However, the RNN-based model received the highest score in recommending the appropriate drugs. Therefore, these results prove that deep learning can effectively optimise formulations of drugs for T2D patients and thus represent a data-driven solution for real-time, personalised diabetes management. The application of this research can contribute to the broader discipline of precision medicine.

Paper ID- 71

A PREDICTIVE APPROACH FOR ASSESSING MEDICATION RESPONSIVENESS IN BREAST CANCER THROUGH ANALYSIS OF GENE DATA

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Breast cancer remains one of the leading causes of cancer-related deaths worldwide, with treatment responses varying wildly among patients. The inability to predict how an individual patient will respond to a given particular medication is an essential area in optimising treatment plans and better outcomes in such deadly diseases. This research aims to address the challenge of predicting medication responsiveness in breast cancer, analysing genomic data by exploiting publicly available datasets from both The Cancer Genome Atlas (TCGA) and the Gene Expression Omnibus (GEO). The datasets are comprised of gene expression profiles, somatic mutations, and clinical data such as patient demographics, tumour subtypes, and treatment outcomes. Preprocessing involved cleaning and normalisation of gene expression values, imputation to address missing data, and selection of essential genes that were most relevant for drug response using feature selection

techniques. Its dimensionality was reduced using Principal Component Analysis (PCA). Four machine learning models, including artificial neural networks (ANN), Convolutional Neural Networks (CNN), recurrent neural networks with long short-term memory (RNN-LSTM), and autoencoders, are used in this research. All models were trained, validated, and tested against accuracy, precision, recall, F1 score, and AUC-ROC in that the highest performance was achieved at 98.89% accuracy using the CNN model. The findings point towards the fact that deep learning models, especially CNN, open promising avenues for personalised breast cancer treatment. The findings, therefore, hold significant importance for the application of AI in precision medicine, potentially enabling more accurately targeted therapies, minimising side effects, and ultimately improving patient outcomes in oncology.

Paper ID- 76

PREDICTIVE MODELING OF SOLAR POWER GENERATION USING DEEP LEARNING FOR REAL-TIME OPTIMIZATION IN PHOTOVOLTAIC SYSTEMS

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This research addresses the need for precise solar power generation forecasting and optimization of energy management within photovoltaic systems; this is important as there is a greater demand for renewable energy sources. Reliable predictions of the output of solar power would enhance stability in the grid and thus ensure efficient distribution of the energy. This research uses deep learning techniques, the LSTM model, to predict solar power generation from several environmental variables, including solar irradiation, air temperature, wind speed, relative humidity, air pressure, module power, and module temperature. To validate the performance of the model, rigorous use of metrics like MAE, RMSE, and MAPE was made. The proposed LSTM model gave an MAE of 0.25 kW, an RMSE of 0.35 kW, and a MAPE of 5%. This was better compared to other models like GRU, RNN, and ANN. A real-time implementation of the LSTM model depicted the fact that it is feasible to use the model to make correct predictions of the amount of solar power produced throughout the day. At peak periods, such as midday hours, accuracy levels hit 98% in some cases, whereas the model is compelling enough to pinpoint and respond accordingly to changing solar power production volumes for optimizing load management and energy supply. This research verifies the deep learning model and its efficiency in energy forecasting, with intense stress on the practical application of the LSTM model in real-time energy management, contributing a lot to the advancement of renewable energy integration and optimizing power systems. Finally, this research provides valuable insight into improving the operational efficiency of photovoltaic systems in order to make the future energy scenario more sustainable.

Paper ID- 103

ENHANCING LUNG CANCER DETECTION ACCURACY: IMPLEMENTING SMOTE FOR BALANCED LEARNING

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This research goal is to forecast lung cancer using machine learning, and addressing the dataset's class imbalance is a top priority. The data that was initially gathered was extremely unbalanced, with 87.38% of instances being of the minority class of lung cancer and only 12.62% being non-cancer cases. To address this imbalance, minority over-sampling through self-generated SMOTE (Synthetic Minority Over-sampling

Technique) was implemented wherein there were 64.85% cases of lung cancer and 35.15% of non-lung cancer cases after deduplication. Logistic regression (LR), Gaussian naive Bayes, Support Vector Machine (SVM), Bernoulli naive Bayes, K nearest neighbors (KNN), Random Forest (RF), multi-layer perceptron, and extreme gradient boosting are among the machine learning methods that were tested. The best test performance was shown by the Random Forest and Extreme Gradient Boosting methods that achieved an accuracy of 97.3% followed by K Nearest Neighbors at 95.95%, and Multi-Layer Perceptron at 93.24%. This highlights the necessity of data balance and the ways in which these methods can improve the efficacy of predictive models for lung cancer. As such, this addition contributes to the dearly needed critical knowledge which may be a stepping stone for innovation within the domains of diagnosis and treatment medicine through machine learning.

Paper ID- 111

OPTIMIZING MARATHON PERFORMANCE WITH THE DEEP NEURAL NETWORK

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The individual marathon optimal pacing sparring the runner to hit the "wall" after 2h of running remain unclear. In the current study we examined to what extent Deep neural Network contributes to identify the individual optimal pacing training a Variational Auto Encoder with a learning dataset. This last one has been constructed from an original one that contains the values of multiple physiological variables for 10 different runners during a marathon. We plot the Lyapunov exponent/Time graph on these variables for each runner showing that the marathon wall could be anticipated. The pacing strategy that this innovative technique sheds light on is to predict and delay the moment when the runner empties his reserves and 'hits the wall' while considering the individual physical capabilities of each athlete. Our data suggest that given that a further increase of marathon runner using a cardio-GPS could benefit of their pacing run for optimizing their performance if AI would be used for learning how to self-pace his marathon race for avoiding hitting the wall.

Paper ID- 134

FINE-TUNED XCEPTION MODEL FOR ACCURATE BRAIN TUMOR CLASSIFICATION: A DEEP LEARNING APPROACH

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The conditions are fatal and therefore the need for early diagnosis and accurate results to enhance on proper treatment. The modern advances in the field of Deep learning show great promises in automating the analysis of medical images and bringing accuracy to diagnostic levels. In this work, the performance effectiveness of the fine-tuned Xception model for classifying brain tumors based on MRI images is investigated. Using glioma, meningioma, pituitary tumor, the Xception model was fine-tuned as a transfer learning strategy to identify appro- priate higher-level features that increases classification quality. To make the model less sensitive to both the image size and its orientation additional preprocessing steps were used: resizing, normalization and data augmentation. The proposed model provided approximately 96% classification accuracy, and it was faster than the standard CNN architectures. While precision, recall, and accuracy, as well as the F1-score, provided better evidence across all classes of the model's accuracy. The approach used in the current work demonstrates the

effectiveness of using the Xception model in the diagnosis of brain tumors and the need to reduce the manual interpretation process in clinics. Future work also plans to use the framework in real-time diagnostic systems where a broader application of better medical imaging will be more available to the public.

Paper ID- 173

TOWARDS DERMATOSCOPIC IMAGING AND CNN BASED ACCURATE SKIN CANCER DETECTION

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Skin cancer is the most common and deadliest type of cancer from an incidence viewpoint. Melanomas are lethal skin cell malignancies and among the deadliest forms of cancers globally, however early diagnosis significantly enhances treatment results, thus detection poses an excellent challenge as benign lesions appear to be visually similar to malignant lesions. In order to overcome this problem, we design an automated skin cancer detection system by using CNN. The proposed model is trained and validated using the Skin Cancer MNIST: HAM10000 dataset, including 10,015 DIs, which were acquired from Kaggle for the automated detection and classification of skin cancer in seven different categories of skin lesions, namely AKIEC, BCC, BKL, DF, NV, VASC, and MEL. Generalization was achieved through applied data augmentation methods. Training is done on 80% of the dataset with the validation on the remaining 20%. Our proposed CNN model has achieved the precision accuracy score of 98.88%. Thus, our proposed CNN model is above the SOTA methods, including ELM [2], VGG-16 [4], and many other existing CNN models [5], [6], [8]. Our future plan includes incorporating more data sources, along with using techniques based on transfer learning, to improve the robustness of the model and its accuracy for even more effective diagnostics of skin cancer.

Paper ID- 194

LEVERAGING IoT AND MACHINE LEARNING FOR INTELLIGENT WATER QUALITY MONITORING SYSTEMS

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Water quality monitoring is a crucial aspect of public health, particularly in mitigating the risks associated with waterborne diseases and ensuring safe drinking water. Traditional monitoring methods are often labor-intensive, costly, and lack real-time capabilities, making them unsuitable for widespread and rural deployment. This paper examines the integration of advanced technologies, specifically the Internet of Things (IoT) and Machine Learning (ML), to design a sophisticated, low-cost water quality monitoring system. Leveraging an array of sensors, including pH, turbidity, temperature, total dissolved solids (TDS), and dissolved oxygen, combined with the advanced embedded processor, the system ensures seamless data acquisition and processing. IoT enables continuous remote monitoring, while ML algorithms provide predictive analytics and intelligent anomaly detection to identify potential contaminants and trends. These value-driven solutions underscore the transformative potential of advanced technologies in revolutionizing water quality assessment. This review article carefully reviews the available literature on water quality assessment in order to lay out an assortment of conclusions on the concerns, problems, challenges, and research gaps that have emerged during the previous few years. Research gaps are identified by thoroughly examining the previously suggested methodologies. The study presented in this article primarily identified the problems with the accuracy of the models, the generation of data collection mechanisms, and the types of data that were used in the suggested frameworks. Subsequently, research avenues towards smart water quality monitoring are offered by examining key concepts crucial to the expansion of this field of research.

Paper ID- 221

A NOVEL MACHINE LEARNING-BASED FRAMEWORK FOR PREDICTING DIABETES IN HEALTHCARE

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Diabetes, a chronic and prevalent condition, poses significant health challenges globally, necessitating early and accurate diagnosis to prevent severe complications. This study introduces a novel machine learning-based framework for predicting diabetes, leveraging advanced algorithms to enhance diagnostic precision and efficiency in healthcare. The proposed framework integrates data preprocessing techniques, feature selection, and supervised learning models to analyze patient data, including demographic, clinical, and lifestyle attributes. Multiple machine learning algorithms, such as Random Forest, Support Vector Machines, and Gradient Boosting, are evaluated for performance metrics like accuracy, precision, recall, and F1-score. The framework incorporates hyperparameter optimization and cross-validation to ensure robust and unbiased predictions. Experimental results demonstrate the framework's superiority in identifying diabetes risk compared to traditional diagnostic methods. By enabling healthcare providers to identify high-risk patients proactively, this approach has the potential to improve early intervention strategies, reduce healthcare costs, and enhance patient outcomes in diabetes management.

Paper ID- 222

A MACHINE LEARNING SYSTEM TO ENHANCE IT SECURITY IN HUMAN RESOURCE MANAGEMENT

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The increasing reliance on digital systems in Human Resource Management (HRM) has amplified the need for robust IT security to protect sensitive employee data and prevent cyber threats. This study presents a machine learning-based system designed to enhance IT security in HRM by detecting vulnerabilities, preventing unauthorized access, and mitigating data breaches. The proposed system leverages advanced machine learning algorithms, including anomaly detection models and classification techniques, to identify potential threats in real-time. Key components include behavioral analysis of system users, anomaly detection in access patterns, and predictive analytics for threat modeling. The system integrates seamlessly with existing HRM platforms, providing adaptive security measures such as automated alerts and dynamic access controls. Performance evaluation reveals significant improvements in threat detection accuracy and response time. This framework empowers organizations to safeguard HR data, ensuring compliance with regulatory standards and fostering trust in digital HRM processes.

Paper ID- 225

SMISHING DETECTION USING SUPPORT VECTOR MACHINES

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This study proposes a novel approach to detect smishing attacks, leveraging Support Vector Machines (SVMs). I analyze the linguistic and structural features of smishing messages and develop a supervised learning model using SVMs. By evaluating the model's performance compared to Logistic Regression and exploring different kernel functions, my research aims to contribute to cybersecurity efforts. The proposed SVM- based model offers a promising solution to mitigate the escalating threat of smishing attacks.

Paper ID- 228

A STUDY ON GYNECOLOGICAL CANCERS USING ARTIFICIAL INTELLIGENCE: A REVOLUTIONARY APPROACH

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An examination of the role of artificial intelligence (AI) in ovarian, cervical, and breast cancer early detection and management is presented in this paper. Artificial intelligence (AI) can improve diagnostic accuracy, streamline treatment protocols, and facilitate personalized medicine approaches by leveraging advancements in machine learning (ML) and deep learning (DL). Various Artificial Intelligence models have demonstrated success in improving the outcomes of cancer diagnostics, including their ability to distinguish benign from malignant tumors. Technology challenges and ethical issues related to the integration of AI into clinical practice are also discussed in the review. Specifically, we want to illustrate how artificial intelligence can lead to better prognoses and reduced mortality rates for cancer patients by enhancing early detection capabilities.

Paper ID- 229

PREDICTIVE HEALTH ANALYSIS: UNVEILING DISEASE PROGNOSIS

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This paper presents the development of a health aid platform that uses machine learning to predict diseases based on user-entered symptoms. The platform also integrates a chatbot to give personalized advice on disease precautions and preventive measures. By using datasets from Kaggle, the system trains multiple machine learning models such as Support Vector Clas- sifier, Naive Bayes Classifier, and Random Forest Classifier. The chatbot, developed with natural language processing techniques, enhances user interaction by offering tailored guidance on health management. This project aims to improve healthcare accessibil- ity, enabling users to make informed decisions about their health and take proactive steps to prevent diseases. The architecture of the

system is designed to ensure seamless integration and robust performance, providing correct predictions and valuable health insights. Evaluation of the system's accuracy and usability is conducted to confirm its effectiveness in real world scenarios. This innovative health management approach can revolutionize how individuals access and use healthcare information, promoting a proactive and informed approach to personal health.

Paper ID- 236

EMPOWERING E-COMMERCE DECISIONS THROUGH AI-ENHANCED REVIEW ANALYTICS

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Due to huge customer market product reviews are large in number and complicated. Thus, understanding the actual essence of the feedback is difficult. The system proposed by us is complex but it tackles the issues faced by previous systems. The paper serves as guideline for creating such system. For gathering data the method of web scraping is used, followed by preprocessing data using Natural Language Processing (NLP) techniques. For prediction purpose deep learning models LSTM and Convolutional Neural Networks (CNNs) are used along with Classification model XGBoost. Through our system we have presented the results visually so that consumers as well as Business stakeholders can take actionable insights. The system has great potential in variety of sectors as it can capture the sentiment of the reviews for a product and also its genuineness with precise accuracy. It has achieved fabulous training accuracy of 89.19% and validation accuracy of 81.49%. It represents the true sentiment of the customer feedback eliminating the fake reviews.

Paper ID- 254

OPTIMIZING THE ALLOCATION OF DYNAMIC WORKLOADS IN CLOUD INFRASTRUCTURE THROUGH THE USE OF MACHINE LEARNING FOR COST-EFFECTIVE CLOUD RESOURCE MANAGEMENT

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The effective administration of dynamic workloads has emerged as a major obstacle for enterprises moving their operations to cloud computing. Intelligent allocation algorithms that guarantee optimal performance while minimizing operational expenses are necessary due to the fluctuation in demand for cloud resources. In order to achieve efficient and economical management of cloud resources, this study explores the use of machine learning (ML) methods to improve the distribution of dynamic workloads inside cloud infrastructure. In order to examine past workload data and forecast future resource needs, we present a thorough system that employs multiple ML algorithms, including supervised and unsupervised learning approaches. Our framework's goal is to automatically adjust to changing workload patterns and avoid under- or over provisioning of resources by using data-driven insights to improve resource allocation in real-time. The platform relies on predictive analytics to foretell changes in workload, automatic resource scaling according to demand forecasts, and reinforcement learning to enhance allocation tactics in real-time. Extensive simulations and case studies are conducted across various cloud settings to test the efficiency of the proposed framework. In comparison to more conventional allocation strategies, the results show markedly higher rates of resource usage and lower costs. The flexibility of the framework to handle different types of workloads also highlights its wide range of possible uses in cloud computing. This research adds to the existing literature on cloud resource management and provides a solid method for improving the overall efficiency of cloud infrastructure and maximizing the distribution of workloads. Results highlight machine learning's revolutionary effect in propelling affordable cloud-based solutions for dynamic workload control.

Paper ID- 260

COMPARATIVE ANALYSIS OF IN SILICO TOOLS FOR DRUG SIDE EFFECT PREDICTION

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In silico tools are being developed and used these days to make predictions in the field of medicine. They are being used in scientific research where they are helping to ease out the process of developing new techniques and products. Cancer research is also being benefitted from these tools. There are special algorithms developed which form basis of these in silico tools. Molecular Docking is one such tool that can be based on principles like Artificial Intelligence, Machine Learning etc. It is used to understand interactions between drugs and how do they impact the body, what makes the difference in the biologic system and how do these compounds actually cause side effects. Here is a review of Molecular Docking tools which can predict the interactions between two compounds on basis of their biding energy and other parameters. These tools will be analyzed on basis of predictions they make and on basis of this analysis, best tool will be used chosen for making adverse reaction analysis of Dabrafenib, which is an anti-cancer drug administered to melanoma patients.

Paper ID- 265

UNMASKING REALITY: A COMPREHENSIVE REVIEW OF DEEPFAKE DETECTION TECHNIQUES AND THEIR EVOLVING LANDSCAPE

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Deepfake technology's widespread use has created serious problems with privacy, security, and authenticity in the fields of politics, digital media, and private life. This article offers a thorough analysis of deepfake detection methods with an emphasis on developments in computer vision and machine learning. We classify existing detection techniques into supervised, unsupervised, and hybrid models and evaluate their performance and drawbacks in a range of real-world situations. We also examine current developments in deepfake production, which make detection more difficult and continually improve the complexity of synthetic content. The technological difficulties and ethical issues that researchers encounter are also included in our review, which highlights the pressing need for flexible, reliable, and scalable detection techniques to combat changing threats. In addition to outlining possible research avenues for strengthening digital media's resistance to deepfake manipulation, this study attempts to offer a systematic overview of the state of deepfake detection today.

Paper ID- 266

EVALUATING ENSEMBLE LEARNING APPROACHES IN IOT-BASED PREDICTIVE ANALYTICS FOR ELDERLY EAR HEALTH MANAGEMENT

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Proactive health monitoring solutions are becoming more important due to a growing population of older people. To better manage the ear health of the elderly, this research investigates ensemble learning methods within the domain of predictive analytics using the Internet of Things (IoT). It provides an ensemble learning approach that uses IoT capabilities to predict potential ear health problems in this population. It evaluates the efficacy of many ensembles learning approaches, including bagging, boosting, and stacking, using real-world

sensor data acquired from IoT devices. Our results show that ensemble learning methods considerably improve prediction accuracy compared to standalone models. Ensemble learning overcomes the limitations of individual algorithms and maximizes their combined prediction potential by efficiently combining varied models. Our findings have important implications for the management of healthcare for the elderly, providing new opportunities to enhance early diagnosis and intervention techniques for ear health concerns via the use of predictive analytics provided by the IoT. It highlights the potential of ensemble learning approaches to improve predictive analytics in the senior healthcare sector, especially with IoT-driven solutions.

Paper ID- 267

SMART DISINFECTANT DISPENSERS WITH IoT SENSORS AND AI FOR OPTIMAL USAGE IN PUBLIC SPACES

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Ensuring hygiene in public areas is of utmost importance now that there are worldwide health concerns. This research proposes a novel approach to creating smart disinfectant dispensers fitted with Internet of Things (IoT) sensors and Artificial Intelligence (AI) to maximize their use in public areas. By using IoT technology, the system can measure disinfectant levels, detect human engagement in real time, and monitor dispenser use. Machine learning models examine the data to find the best time to restock, predict when repairs will be necessary, and personalize the dispensing amount for each user according to their habits and conditions. The system also works with cloud platforms and mobile apps for remote monitoring and data analytics, giving administrators full control and visibility. Along with lowering operating expenses and ensuring a constant supply of disinfection, this method also reduces waste. Smart disinfectant dispensers build healthier communities that can withstand outbreaks by encouraging regular and thorough handwashing.

Paper ID- 268

LEUKEMIA CLASSIFICATION USING CNN AND VGG19 ARCHITECTURE

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Leukemia, a severe kind of blood cancer marked by aberrant white blood cell proliferation, presents great difficulties for diagnosis and categorization. Effective treatment planning and enhancement of patient outcomes depend on precise identification of leukemia subtypes. Based on the VGG19 architecture, this paper offers a Convolutional Neural Network (CNN) model to classify leukemia into four subtypes: Benign, Malignant PreB, Malignant Pro-B, and Malignant early Pre-B. High accuracy is obtained by the model using transfer learning and fine tuning on a dataset of leukemia cell images, thereby lowering training time and improving performance. Our results show that, surpassing conventional diagnostic approaches and current Machine Learning (ML) models, the VGG19-based CNN model achieves an accuracy of 99.1%. This study underlines the need of automated systems in the diagnosis process and the possibilities of Deep Learning (DL) methods in medical image classification. Aiming for enhanced accuracy and efficiency in clinical settings, the results open the path for more research of sophisticated computational methods in the diagnosis of leukemia.

Paper ID- 269

ROBUST CLASSIFICATION OF BREAST CANCER WITH SUPPORT VECTOR MACHINE

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Among women worldwide, breast cancer is among the most often occurring and deadly diseases. Improving survival rates depends mostly on early diagnosis, which has driven the application of machine learning methods for automated breast cancer case classification. This work uses the Wisconsin Breast Cancer Dataset to explore Support Vector Machine (SVM) application for breast cancer prediction. Included into the dataset are thirty features extracted from digital images of fine needle aspirates of breast masses: radius, texture, and perimeter. Preprocessing and feature scaling produced training and test subsets of the dataset. Running with a radial basis function (RBF) kernel and through grid search, the SVM model on the test set had an accuracy of 98.24%. The findings show how well SVM manages high-dimensional, complex data and achieves significant accuracy in binary classification issues. These findings highlight the importance of SVM for medical diagnosis applications, particularly for the prediction of breast cancer, therefore paving the way for further advancements in clinical decision support systems.

Paper ID- 273

TRAVELTREK : EFFORTLESS TRAVEL CRAFTING AND MANAGEMENT

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Today's rapidly changing world has led travelers to seek customized experiences that align with their individual preferences and interests. With the continuous evolution of the digital realm, the expectations of users interacting with online platforms for travel planning and reservations are also evolving. To cater to the demand for personalized recommendations and enhance the user experience, we propose the incorporation of a Content-Based Filtering algorithm into our tour website. This algorithm, in conjunction with a recommender system for Travel and tourism management, enables users to book tours nationwide through a single dynamic website that provides comprehensive information on various destinations and tour specifics. Developed with PHP as the front end and Microsoft SQL Server 2008 as the back end, the website is compatible with all browsers. Programming languages such as HTML, CSS, Bootstrap, and PHP were utilized in its creation. Administrators have the capability to add tour packages from selected travel agents and hotels by establishing a tour page. Subsequently, users can register and reserve each package, with confirmation managed by the admin in the booking management section. Users can easily view their confirmations in the "My Booking" page, making this platform user-friendly for all travelers seeking seamless bookings and detailed information. Furthermore, alongside implementing a Content-Based Filtering algorithm for personalized tour recommendations, we aim to promote the availability of accommodations in local rural areas. This endeavor not only presents travelers with cost-effective lodging choices but also contributes to the economic growth of the communities they visit.

Paper ID- 292

THE INTERNET OF HEALTHCARE THINGS (IoHT): DEVELOPING PATIENT CARE AND MEDICAL OUTCOMES WITH CONNECTED HEALTHCARE TECHNOLOGIES

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Patient care and the outcomes of medical procedures are undergoing a transformation as a result of connected healthcare technologies. The Internet of Healthcare Things (IoHT), which is a subset of the Internet of Things (IoT) that focuses on applications related to medical and healthcare, is the driving force behind this transition. The objective of this research is to analyze the development of technologies related to the Internet of Things (IoT) and the impact that these technologies have had on the healthcare industry. To be more specific, the research studies how these technologies can improve patient monitoring, increase the effectiveness of treatment, and contribute to personalized medicine. Wearable technology, remote monitoring systems, and intelligent medical equipment are all subjects that are studied in this study, which focuses on clinical and home care settings. The study also concentrates on the usage of these technologies. Both the huge amounts of health data that are generated by devices connected to the Internet of Things (IoT) and the role that data analytics and cloud computing play in the processing and interpretation of this data are analyzed as well. In terms of improving patient outcomes, lowering healthcare expenses, and increasing the efficiency with which healthcare is given, the research highlights the benefits of Internet of Health Technologies (IoHT). In order to achieve this goal, a comprehensive analysis of case studies and applications that are grounded in the actual world is carried out. According to the findings, the Internet of Things has the potential to bring about a revolution in the healthcare industry. This opportunity arises from the fact that it makes it possible to implement proactive and preventive treatment approaches. Nevertheless, the research has also addressed the challenges that are associated with the Internet of Health Technologies (IoHT).

Paper ID- 312

REAL-TIME COLLEGE BUS TRACKING APPLICATION DESIGNED FOR HYBRID SMARTPHONES

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Real-Time College Bus Tracking Application designed for hybrid smartphones. It allows students to track the bus's location, helping them avoid being late or arriving at the stop too early. The primary aim of this application is to provide the precise location of students' buses on Google Maps, along with details such as bus information, driver information, stops, contact numbers, and routes. Additionally, the application estimates the time needed to reach specific stops along the route. To enhance user experience, the app features real-time notifications about bus delays or schedule changes, ensuring students are always informed. It also includes a user-friendly interface that allows for easy navigation and accessibility for all students, including those with disabilities. Furthermore, the application integrates a feedback mechanism, enabling users to report issues or suggest improvements directly to the administration. By incorporating GPS technology and advanced algorithms, the app can provide accurate updates on bus locations, optimizing route efficiency. Overall, the Real-Time College Bus Tracking Application significantly enhances the commuting experience for students by providing precise bus locations and real-time updates. Its user-friendly design ensures accessibility for all, including those with disabilities. The integration of a feedback mechanism fosters direct communication with the administration, allowing for continuous improvement. By leveraging advanced GPS technology, the app not only optimizes route efficiency but also keeps students informed and empowered throughout their journeys.

Paper ID- 314

BEHAVIORAL ANALYTICS FOR PREDICTIVE MODELING OF MENTAL HEALTH DISORDERS: A REVIEW OF MACHINE LEARNING TECHNIQUES AND CHALLENGES

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A person's general well-being and productivity are negatively impacted by mental health issues, such as depression, anxiety, and stress, which are common and can go undiagnosed until they reach severe stages. For effective intervention and therapy, timely identification is crucial. Behavioral analytics, enhanced by machine learning techniques, functions as a powerful tool for the predictive modeling of mental health disorders, enabling early identification through the analysis of behavioral data. This paper provides an in-depth analysis of the use of machine learning methods—including deep learning models and supervised and unsupervised learning—to behavioral data, such as speech patterns, facial expressions, and activity levels, in order to identify mental health indicators. We examine numerous machine learning algorithms' benefits and limitations, focusing on how they might be used to identify patterns associated with illnesses like stress, anxiety, and depression. This research also looks at the challenges that this sector has, including data privacy, the need for large and diverse datasets, interpretability of models, and combining behavioral data with other environmental and physiological factors. By thoroughly analyzing these approaches and challenges, we want to clarify how machine learning might revolutionize mental health diagnostics and deliver timely, customized treatments.

Paper ID- 330

AI-POWERED VIRTUAL REALITY: TRANSFORMING EDUCATION BEYOND CONVENTIONAL APPROACHES

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The evaluation of a Virtual Reality (VR) application aimed at improving electrical and electronic engineering students' comprehension of Python collection data kinds and structures is examined in this research. Students are able to interact with virtual representations of intricate programming ideas in an immersive environment created by the application's integration of gamification and personalization elements. The program uses a virtual assistant and an example generator driven by wit.ai and Meta Voice SDK to increase interaction and engagement. According to each user's success, these AI-NLP technologies provide dynamic examples and modify learning paths. 48 participants were split up into two groups of 24 for the user study. Electroencephalography (EEG) headsets were utilized by both groups to track their degrees of interest and attention. While one group used conventional pamphlets, the other group engaged with the VR application. Metrics of attention and engagement from these groups were contrasted with baseline information from a benchmark cohort that received instruction through traditional means. Based on the pre- and post-study scores, the results showed that VR users' grasp of Python collections had improved statistically significantly. Additionally, compared to those who used paper-based materials, VR users maintained higher levels of attention and engagement, according to EEG research. These findings highlight how immersive and adaptable virtual reality technology may maintain student attention and improve comprehension, especially in the context of software development instruction.

Paper ID- 331

ENHANCING TAILORED TRAVEL BY INTEGRATING GENERATIVE AI WITH INSIGHTS DRIVEN BY PERSONALITY

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Recent years have seen a revolution in personalized travel recommendation systems thanks to generative Artificial Intelligence (AI) approaches, especially the Retrieval-Augmented Generator (RAG) architecture. Through the use of natural language questions, the RAG framework combines the advantages of retriever models and large-scale language models to generate a variety of contextually appropriate suggestions that are customized to each user's preferences. These systems employ iterative learning to improve the quality of their recommendations by continuously adjusting in response to user input. This flexibility guarantees that suggestions stay tailored, taking into account shifting user tastes, new travel trends, and situational considerations. By integrating personality models, such the Big Five (BF) and Myers-Briggs Type Indicator (MBTI), into customized travel systems, our research builds on this breakthrough. By improving knowledge of user preferences and behaviors, this method makes recommendations that are even more accurate and tailored to the individual. Our objective is to revolutionize customized travel experiences by fusing knowledge from personality psychology with cutting-edge AI methods like the RAG framework. The potential of these AI developments to interpret natural language queries, obtain pertinent data from vast knowledge libraries, and produce recommendations enhanced with context and personality alignment is highlighted as we explore their underlying theories, methods, and technological nuances. Results from our personalized trip suggestion system are noteworthy: system accuracy (82%), user satisfaction (78%), and performance based on personality factors (85% for extraversion and 75% for introversion).

Paper ID- 340

AN INTEGRATED IoT AND WIRELESS SYSTEM FOR ENERGY OPTIMIZATION AND REAL-TIME MONITORING TOWARDS SUSTAINABLE AND EFFICIENT BUILDING MANAGEMENT IN SMART BUILDINGS

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At a time when urbanization is increasing, and the world's energy need is growing, energy efficiency in building elements has become a key factor in the environment impact mitigation and operational cost reduction strategies. Building management is governed by traditional operational features that are often inadequate to contemporary occupation patterns, infrastructural demands, and environmental changes. Consequently, there is a growing tendency towards the implementation of integrated systems such as autonomous management systems which can oversee energy use and other resources without sacrificing comfort and safety. Cloud storage and wireless technologies have now made it possible to improve energy management like never before. By making use of such technologies, smart building systems are able to receive, transmit and monitor data from many networks in real time. This capability further enhances the control of energy-demanding devices and processes such as heating, ventilation, and lighting, which are controlled and manipulated by preset schedules and manual settings. In addition to this, predictive maintenance and detection of inefficiencies is possible due to real time data analysis trends, usage history and anticipation of external consumption forces.

Paper ID- 341

AN IoT-DRIVEN WORKERS HEALTH MONITORING SYSTEM UTILIZING LoRa TECHNOLOGY FOR REAL-TIME VITAL SIGNS COLLECTION, TRACKING AND CLOUD-BASED DATA LOGGING AT INDUSTRIAL ENTRY POINTS

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With the rapid rise of IoT tech, new possibilities have emerged in areas such as health monitoring, especially in industries that require OHS. Traditionally, workplace health monitoring took a reactive stance resolving any adverse health conditions whenever they arise. Nonetheless, given that there have been shifts in technology and operational practices, what was once impossible has now become realizable – and that is the implementation of systems that continuously perform health monitoring in real-time. Such systems offer a constant evaluation of the most important health parameters with the aim of detecting health problems and preventing related adverse events at the early stage. This is particularly important in the workplace where the physical demand and hazards related to the occupation are high. With the advent of IoT technologies, the way of health insight which was very mechanized and physical in nature has changed to an intact automation system. Such a shift is, however, not simply improvement of technologies but a great efficiency advancement in health management at workplaces. Because of the connection of the cloud technology, the health status information is kept, and tested in one place, and relevant superiors and medical professionals are provided with the information they require to act quickly. Within this setting, IoT oriented technologies develop systems that act as the first line of defense in ensuring minimal delay response time in case there are health adversities, active surveillance on worker's health is also achieved. This paper presents a comprehensive improvement of an existing product intended to solve such problems. It shows how the problem of safety in the workplace can be achieved easily.

Paper ID- 342

DIGITALIZATION OF INTEGRATED INDUSTRIAL IoT TECHNOLOGIES FOR MONITORING AND CLOUD ANALYTICS IN SUSTAINABLE HORTICULTURAL PRACTICES

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Agriculture has been one of the most important areas that human being has to rely on but due to ever rising global population and ecological crises, there is an increasing demand for ecological farming techniques. Industry 4.0 is the latest evolution of industries that integrates tools such as IoT, AI, and big data and has the potential to transform agriculture. These technologies allow for precise agriculture, resource management, and better decisions to be made, catalyzing farming practices to be more eco-friendly and effective. One of the important limitations of modern farms is the ability to assess environmental attributes influencing plants' growth and yield. Most traditional techniques do not provide timely assessments and insights, which leads to excessive or insufficient use of inputs, especially water, fertilizers, and pesticides. This kind of mismanagement not only reduces the efficiency of agricultural output but also brings adverse effects to the surrounding nature. By employing digital systems that measure and evaluate state variables of the environment, farmers can intervene appropriately in the crop production process to improve plant health, conserve resources, and protect the environment.

Paper ID- 343

PEER-TO-PEER INTEGRATED SMART GARDENING AUTOMATION USING CLOUD TECHNOLOGY WITH REAL-TIME ENVIRONMENTAL MONITORING AND LOGGING VIA BLYNK CLOUD DASHBOARD

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The authors of this article discuss the holistic method of automation of gardening operations based on IoT technology that allows real time environmental factors to be monitored, decisions to be made based on data, and those decisions to be executed at a distance. The objective of the system is to minimize the amount of water used, to improve the state of the plants, and ultimately to allow the users of the system to control their gardens from anywhere in the world with as little effort as possible. The concept makes use of the continuously monitored network of sensors to observe important parameters like soil moisture, temperature, humidity, light intensity and rainfall among others. After being received, this information is up to date and the system will use this data to manage irrigation and lighting systems for the plants efficiently. Also, the support of this cloud-based platform is essential today as it allows the users to look up the parameters in their garden remotely and go for manual intervention when required. All the advantages of cloud technology provide remote control of the system but also all the historical data sets which are important trends in future decision making.

Paper ID- 344

DESIGN AND IMPLEMENTATION OF AN IOT-BASED SMART VEHICLE VENTILATION SYSTEM TO ENHANCE AIR QUALITY AND TEMPERATURE CONTROL WITH REMOTE MONITORING AND AUTOMATION

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heightened attention placed on sustainable urban mobility has propelled the development of a range of vehicle technologies aimed at improving the comfort of users and more importantly, their ecological impact. One of the challenges that is gaining ground in the directions of modern vehicles, particularly in hot and urban areas, is the need for control of the cabin air quality as well as the cabin temperatures. Increased ventilation in vehicles that are poorly maintained may result into discomfort and health risks as well as wastage of fuel where the air conditioning is over used. Continuous breathing of air that has low air exchange can lead to high levels of carbon dioxide (CO2) and low levels of breathable air that can cause serious health problems to both drivers and passengers. In addition, urban pollution of the air worsens the situation so that, to maintain a safer in-vehicle environment, effective ventilation systems are required. Due to these phenomena, there is a rising demand for automatic solutions that can monitor, manage and improve the air quality and temperature levels in vehicles. In most cases, vehicles' ventilation systems are dependent on air conditioning unit and manual systems; however, new technologies like the Internet of Things (IoT) have made it possible to develop better and intelligent climate control systems. These systems can operate automatically without requiring human action by employing real-time data, rendering them both convenient and energy efficient.

Paper ID- 352

SMART GESTURE INTERACTION ENHANCING ACCESSIBILITY FOR VISUALLY IMPAIRED INDIVIDUALS

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The majority of visually impaired user assistance systems concentrate on particular activities, such as reading text or identifying obstacles, and frequently need users to switch between programs for different purposes. This work presents a mobile system that uses an Open CV-based algorithm for real-time gesture recording and processing, allowing users to do a variety of help tasks using simple hand gestures. In the first step, a multi-head neural network architecture recognizes movements; in the second stage, it initiates activities such as environment recognition or object description. With 40,000 different images including synthetic gestures trained on the dataset, the system performs competitively in gesture classification and localization. For visually challenged users, this integrated method simplifies device control by providing an effective, multipurpose helper.

Paper ID- 377

HYBRID DEEP LEARNING FRAMEWORK FOR ROAD SURFACE CLASSIFICATION: INTEGRATING AUTOENCODER-BASED DENOISING AND CNN-BASED CLASSIFICATION

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This study classifies asphalt, pavement, and unpaved roads using a hybrid deep learning technique. In real-world circumstances, image data noise can damage image categorization algorithms. This issue can be addressed by a deep neural network (DNN)--based classification system that uses advanced denoising algorithms to improve input images before categorization. We start by denoising noisy native images with autoencoder (AE) approaches. We use two autoencoders: Denoising Autoencoder(DAE) and Convolutional Denoising Autoencoder(CDAE). Proper categorization requires models that filter noise and increase visual clarity. The CDAE employs convolutional layers to maintain spatial hierarchies and local characteristics during denoising, whereas the DAE involves encoding and decoding to rebuild images. The rebuilt images are classified using a CNN after denoising. The CNN is a preferred DNN architecture for this job since it can gather and represent complex visual input. CNN identifies classification-boosting features using noise-free image training. Experiments show this hybrid model works. With 97.92% classification accuracy, the CDAE-CNN architecture could recognize road surface types and conditions under noisy environments. This performance proves the hybrid approach's durability despite training on noise-corrupted images. It improves image classification in noisy data. Denoising algorithms improve deep learning classifier accuracy and make them more relevant in real-world applications with low image quality. These hybrid DAE-CNN/CDAE-CNN models minimize noise and properly categorize road surfaces.

Paper ID- 424

ESTIMATION OF SOFTWARE RELIABILITY TESTING USING MACHINE LEARNING TECHNIQUES

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This research article addresses the growing need for accurate forecasts in software quality assurance by means of advanced machine learning approaches, "therefore estimating the degree of program reliability. Conventional models of dependability sometimes neglect the complexity and changing nature of modern software systems, therefore affecting the risk assessment and resource allocation. By analyzing fault distributions, use patterns, and defect trends, we use machine learning techniques including decision trees, support vector machines, and neural networks to replicate software dependability in this work. The approach consists on gathering failure data from actual software projects, then in feature engineering and predictive model development. To see just how well such models are adaptable on a range of computing systems, we examined the precision, accuracy, and scalability of these models. Due to this fact, the machine learning approaches turn out to be very strong in comparison with traditional methods of reliability estimation since they enhanced reliability predictions can be given with these methods, and also more detailed information can be obtained regarding the locations of potential failures. Better risk management, more effective maintenance plans, and optimum testing methodologies are just some of the practical implications of these discoveries that this paper covers. Software failures can cause huge impacts across sectors in today's era; hence, this work will contribute to the creation of more resilient and fault tolerant systems by embedding machine learning into software dependability estimation. It changes the paradigm in software engineering.

Paper ID- 427

COMPARATIVE ANALYSIS OF CHARGE PLASMA VERTICAL TFET STRUCTURES WITH Hf O2 and SiO2 GATE DIELECTRIC MATERIALS

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This study investigates the impact of different gate dielectric structures on the performance of charge plasma vertical tunnel field-effect transistors (TFETs). Three TFET configurations were considered: a single material gate (Hf O2), a double material gate (Hf O2, SiO2), and a stacked gate (Hf O2 stacked on SiO2). All of the three structures are evaluated using lateral and vertical conduction currents, electron and hole mobilities, and quasi-Fermi levels. The results indicate a major improvement in the devices' performance with the presence of extra dielectric layers in the double and stacked gate structure. The proposed structures allow peak currents, superior carrier mobilities, as well as even more favorable tunneling barriers when compared to the single material gate. The findings suggest that the careful engineering of gate dielectric materials and their stacking can optimize the performance of TFETs, paving the way for their potential applications in future high-performance electronic devices.

Paper ID- 436

ENHANCEMENT OF IMAGE RESOLUTION USING RDB

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By using hierarchical features, Convolutional Neural Networks (CNNs) which is a Deep Learning method have shown notable improvements in image restoration (IR) tasks. However, poor performance arises from many existing deep CNN-based IR models' inability to adequately use the hierarchical information included in low-resolution images.To address the problem of image resolution, this study uses the Residual Dense Network (RDN) technology. RDN seeks to improve how well it uses hierarchical features from every convolutional layer. To be more precise, we have extracted localized information using the Residual Dense Block (RDB) and dense convolutional layers. By connecting all the layers of the present RDB twice the state of the preceding RDB, RDB creates a contiguous memory system. We incorporated Local Feature Fusion (LFF) into Residual Dense Blocks to improve the feature extraction from historical and current local data. This improved the stability of training for larger networks. After getting dense local properties, we used Global Feature Fusion (GFF) to extract global hierarchical features. Through the use of RDN in Image Super-Resolution (ISR), we have proven its efficacy. Our tests on real datasets show that RDN performs exceptionally well on ISR tasks in visual quality as well as quantitative measures.

Paper ID- 437

APPLICATION OF MACHINE LEARNING AND ONTOLOGY IN DIABETES PREDICTION

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Diabetes, a chronic health condition, is witnessing a steady rise in cases annually, highlighting the importance of timely diagnosis and early detection. Recent innovations in ontology-based techniques and machine learning have enabled the creation of automated systems to address this challenge. This study evaluates and compares various approaches, including algorithms like Logistic Regression, Artificial Neural Network (ANN), Gradient Boosting, Decision Tree, KNN, Naive Bayes, and Support Vector Machine (SVM). Performance is assessed through metrics like Precision, Accuracy, F-Measure and Recall get from confusion matrix. Findings suggest that SVM and ontology classifiers deliver the most accurate results.

Paper ID- 439

ORYZA SATIVA: IMAGE CLASSIFICATION USING DEEP LEARNING

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Since rice is the staple food for a large portion of the world's population, its health and productivity are crucial to food security. However, rice plants are susceptible to various diseases that would greatly reduce crop yield. In this paper, we introduced a Convolutional Neural Network (CNN) based model for the automated classification of common rice leaf diseases: Bacterial Leaf Blight, Brown Leaf Spot, Blast, and Sheath Blight. This model was trained from a labeled set of rice leaf images pointed to the respective disease categories. Therefore, this model comprises image preprocessing and augmentation techniques so as to have robust

detection and classification capabilities. For this study, it would be a perfect tool to use in the early disease detection. Experimental outcomes showed a good determination of whether the leaf was healthy or not by this model since the accuracy was higher than the other models. This automatic system would help farmers and agronomists handle the rise or causes of infection during culture, which would reduce the impact infection would have on rice production.

Paper ID- 441

EMOTION-AWARE SPEECH TRANSLATION: A REVIEW

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Emotion-aware speech translation systems are at the forefront of redefining multilingual communication by preserving both linguistic content and emotional context. While traditional speech translation systems excel in semantic accuracy, they often neglect the subtle emotional cues embedded in human speech, leading to incomplete or impersonal communication. This paper explores the integration of emotion recognition with neural machine translation (NMT) models to address this gap. By reviewing state-of-the-art techniques in speech processing, emotion recognition, and multilingual NMT, we identify key challenges and propose a modular architecture that leverages multimodal data for enhanced emotional fidelity. Applications in domains such as mental health, customer service, and cross-cultural diplomacy highlight the transformative potential of this technology. Our findings suggest that a fusion of acoustic, textual, and contextual features significantly improves translation quality, paving the way for emotionally intelligent systems capable of human-like communication.

Paper ID- 442

USING HYBRID GATED RECURRENT NETWORKS TO ANALYZE TWITTER SENTIMENT AND UNVEIL SENTIMENTS

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The most popular and active area of data mining study is sentiment analysis. Twitter is an important instrument for gathering and disseminating people's thoughts, feelings, views, and attitudes regarding specific entities. There are several social media platforms available today. Due to this Natural Language Processing is applied for sentiment analysis field gave rise to fascinating. While numerous methods for sentiment analysis have been devised, there is always room for improvement in system efficiency and accuracy. The suggested framework combines sentiment analysis based on deep learning with efficient optimization-driven feature selection to tackle these requirements. On a dataset of 140 sentiment-labelled texts, we assessed the efficiency of the proposed (GRN) architecture named gated recurrent network. We first cleaned and filtered the dataset to remove any errors or inconsistencies. Then, we used accuracy, precision, to measure and same time we also calculated performance metrics to estimate recall, and F-measure towards the GRN. The results which we have found and shows that on the dataset, the GRN performed at the cutting edge. These results suggest that the GRN is a promising new architecture for sentiment analysis.

Paper ID- 446

SECURING THE COLD CHAIN WITH BLOCKCHAIN TECHNOLOGY: FROM TRACEABILITY TO TRUST

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Blockchain technology has emerged as a game-changing tool that ensures much-needed gains in cold chain logistics through its offering of unparalleled transparency, traceability, and trust among supply chain partners. This paper examines how blockchain can be integrated using IoT-enabled monitoring devices to monitor and record real-time temperature and humidity readings in order to preserve the safety of temperature-sensitive products throughout the cold chain. Key advantages consist of the utilization of immutable, tamperproof records and smart contracts to automate compliance and corrective actions. However, scalability, energy consumption, and integration with the existing systems will remain challenges to wider diffusion of blockchain security. Moreover, budgetary constraint and stakeholder resistance are going to be an important barrier to its adoption. It also talks about the emerging technologies that can help this blockchain-enabled cold chain to grow more robust and efficient: AI, machine learning, 5G, and so on. Finally, recommendations are made to the logistics providers, manufacturers, and regulators for further increased adoption and integration. The future of blockchain in cold chain management thus looks brilliant, as further evolution of these cold chains can go a long way in improving product safety and compliance.

Paper ID- 447

INFLUENCER MARKETING IN THE AGE OF AI: IMPROVING BRAND LOYALTY THROUGH ADVANCED ANALYTICS

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Influencer Marketing in the digital era comes out as the prime tool for brands to reach target audiences. While such competition is on a never-ending rise and consumer needs have altered completely, it is by all means called for to really work out an effective schema. This paper aims high in underlining the roles of AI in transforming every inch of Influencer Marketing as it shapes more precision and, therefore, effectiveness in the marketing drive. Study touch on a few ways AI comes in handy: to identify influencers, segment audiences, optimize content, and detect fraud. AI will perform personalization of content, predict the success of a campaign, and validate influencer engagement with a brand through advanced analytics using complex machine learning models. Besides, AI-driven sentiment analysis gives brands real-time insight into consumers' responses for dynamic strategy changes.

Paper ID- 467

DIABETES PREDICTION USING STACKING ENSEMBLE MODEL

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Diabetes is one of the longterm conditions that are becoming common with every passing year. The problems arise when diabetes can't be detected early and dealt with timely. The prediction system for diabetes utilizes the ensemble learning in order to provide accurate and reliable predictions. An ensemble model of stacking ensemble is created by using RF, AB and XGB as base with the final predictor as LR, with Pima data in handling imbalanced data by SMOTE, with hyperparameter tuning for optimization. Confusion matrices such as recall, accuracy, precision, and F-measure can be used for evaluation of the results. This approach supports the early detection of diabetes by providing accurate predictions, therefore permitting timely interventions and personalized healthcare.

Paper ID- 473

EVALUATING ELECTRIC VEHICLE CHARGING IMPACTS ON DISTRIBUTION GRID STABILITY AND EFFICIENCY THROUGH ADAPTIVE LOAD MANAGEMENT STRATEGIES

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The high growth rates of the EV market create complex issues for distribution grids, forcing a detailed examination of grid responses at high rates of EV deployment. This paper seeks to elucidate the effects of EV charging on the distribution grid stability With this, the impact of the pod on voltage fluctuations, line load, and power loss is assessed using the IEEE 37-bus system. Load patterns of EV charging stations are consequently simulated successfully by a number of real and statistically created synthetic data sources, which truly represent averaged fluctuations in load. The study looks at several charging methods of the EV, such as time of use and smart charging, to determine their impact on the grids. Furthermore, the utilization of renewable energy sources for improving the aspects of grid reliability is explored. Regarding performance aspects related to the expansion of widespread EV charging and the efficiency of the applied measures for grid stabilization, the results of this study offer beneficial information.

Paper ID- 484

SELF-EVOLVING HIERARCHICAL ATTENTION AND CONTRASTIVE GRAPH NETWORKS FOR ADVANCED CORPORATE DATA ANALYTICS

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The need for effective adaptive models that are capable of handling the complexity and uncertainty of corporate data is compelling in the business environments of today. Corporate ecosystems basically rely more on dynamic, dynamic structures, which do not adapt well with static models such as static deep learning models or traditional graph networks. These models suffer from the inability to evolve their architectures dynamically and assume that samples of sequential corporate data are not inherently uncertain. In an effort to overcome these limitations, we introduce three novel architectures: Self-Evolving Hierarchical Attention Networks, Contrastive

Graph Neural Networks, and Recurrent Bayesian State Estimation. The architecture of SE-HAN is dynamic and self-evolving, adjusting the depth and complexities accompanied by attention mechanisms over corporate data streams that can be transactions or communications. This allows better hierarchical representation of information and the precise detection of patterns while diminishing computational costs by about 15%. The C-GNN method mines the contrastive learning-based corporate entity relationship by applying unsupervised learning on supply chain networks or employee interactions to obtain improved anomaly detection by 25%. Lastly, RBSE combines recurrent neural networks with Bayesian state estimation to model uncertainty in time-series corporate data, enriching decision-making by adding the probabilistic forecasting and risk assessment. A major impact is achieving an anomaly detection accuracy of up to 20% and, accordingly, the elimination of false positives, thus improving predictive power in unstructured corporate data environments. This work attains the advancement of corporate data analytics through the incorporation of adaptivity and uncertainty awareness in architectures, thus optimizing the trade-offs between efficiency and accuracy within complex business settings

Paper ID- 488

ENHANCING STRATEGIC MARKETING WITH AI-DRIVEN INSIGHTS INTO DYNAMIC PREFERENCES AND DECISION PATTERNS

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Once AI begins gathering client data, the marketing sector will alter drastically. This research uses sophisticated AI technologies to better understand how complex client behaviors might be. We examine pricing solutions, including social media mood monitoring, joint filtering algorithms for targeted marketing, and reinforcement learning-based dynamic pricing. Neural networks are being investigated for application in e-commerce predictive analytics and predicting subscription cancellations. This research examines clustering algorithms' performance to see whether they may be utilized for cross-channel marketing activities, including consumer segmentation and credit modeling. The article concludes by examining how virtual reality is affecting shop advertising and marketing. The study's findings encompass AI-powered marketing strategies' applications, advantages, and drawbacks. AI helps marketing, according to the findings. Businesses may improve their strategy, communicate with consumers, and meet client needs using this information.

Paper ID- 489

EMOTION DRIVEN GENERATIVE SYSTEMS FOR ENHANCING CREATIVE EXPRESSION THROUGH TECHNOLOGY

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EmoVisArt drastically changes how artists express themselves and employ new tools. This innovative technique creates a dynamic creative experience using powerful algorithms like Emotion Recognition (ER), Generative Art Synthesis (GAS), and Interactive Art Adaptation (IAA). EmoVisArt outperformed conventional approaches in several key areas in our study. EmoVisArt promoted creativity, which is crucial to artistic expression. This method is unique since it can adapt its art to the audience's mood. Machine learning enabled gorgeous and emotionally compelling art. EmoVisArt, a blend of art and technology, displayed innovative innovations. The ER software understood facial expressions well owing to convolutional neural networks. This let the system detect and respond to user emotions. This approach is more sophisticated than prior ones. The IAA algorithm, which enables viewers update their entries in real time, makes EmoVisArt notable for interactivity. By connecting art and users dynamically, this interactive aspect improved the art experience. Traditional techniques struggle for response and engagement. EmoVisArt affected people's emotions due to emotion recognition. By

adapting to audience emotions, EmoVisArt creates a personal connection. EmoVisArt's deep grasp of emotions let it stand out and show its potential to alter creativity.

Paper ID- 490

DESIGNING INTUITIVE USER INTERFACES IN HUMAN-COMPUTER INTERACTION FOR ENHANCED DIGITAL EXPERIENCE

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An inventive approach to creating user interfaces for any profession is suggested. It is the most amazing thing you have ever seen. Focusing on oneself clarifies the complexity of the mind. User-centered designs most likely represent their way of thinking. This improves the interface's usability by strengthening links. By showing how interfaces should be user extensions rather than just tools, this idea revolutionizes user interface design. The goal of this method is to respond to user input as soon as possible. Interfaces that combine mood analysis and real-time monitoring can potentially sense a user's emotions and actions in real time. Definitely not. Therefore, user interfaces could change depending on how the user interacts with the system. Because this approach allows for fully immersive experiences, virtual and augmented reality will be revolutionized. Integrating physical settings with virtual environments may trap people in experiences that are only available through a finite number of one-way paths. This quality attracts customers and makes it easier to create creative digital experiences. It is also recommended to use machine learning to allow for interface customization. Through personalization, screens could adapt, through reinforcement learning, to the words and actions of the user. The adaptive learning of the suggested approach might provide clients with a novel experience. To summarize, the proposed methodology reassesses cutting-edge technologies in relation to user-intuitive designs by prioritizing user-centric principles and adjusting based on feedback from users. These advancements have improved digital interactions, which has led to the expansion of computer functionality and the introduction of new applications.

Paper ID- 492

ViT AND RNN FOR TEMPORAL AND SPATIAL ANALYSIS IN VIDEO SEQUENCES

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This study proposes a novel technique to view dance routines in video clips using Vision Transformers (Vi T) and Recurrent Neural Networks (RNN). The three main algorithms in this new technique are dancing move recognition, temporal dependency modeling, and emotion guessing. Temporal Dependency Modeling employs RNNs to track the sequence of known dance moves across time, whereas Dance Move Recognition uses Vi T to identify dance motions in a video clip. Emotion Inference uses Vi T and RNN to recognize emotions in body language and facial expressions. These principles provide a firm foundation for video sequences comprehension and enjoyment. Our proposed dance routine analysis approach was compared to well-known methods. The evidence shows that the proposed method performs better in several aspects. It recognizes dancing motions 94.5% of the time, better than existing approaches. Our technique also scores 92.3% on the completeness indicator, which measures dance routine maintenance. Our 91.8% timing accuracy shows that our approach can grasp dance timing. The proposed approach scores 88.7% on the expressiveness test, demonstrating its understanding of dance creativity. Real-world apps need real-time processing performance, and our technology tops the competition at 30 FPS. Plus, it uses memory effectively, requiring only 2.5 GB RAM. Our recommended approach excels in emotion recognition. It outperforms other emotion detection systems with 92.1% accuracy. F1 scores 92.2% with 91.3% accuracy and 93.2% memory. Although it works better, the recommended solution consumes just 2.7 GB of RAM and processes at 28 frames per second in real time. Our

dance routine analysis is cutting-edge. Combining Vi T with RNN improves accuracy, completeness, timeliness, and expressiveness. It also recognizes emotions swiftly and with minimal memory. This study enhances our appreciation of dancing. They may also be used to teach dancing, judge performances, and communicate emotional stories.

Paper ID- 493

ENHANCING PATIENT PRIVACY AND DATA SECURITY IN REMOTE HEALTHCARE MONITORING USING IOT AND WEARABLE TECHNOLOGIES

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Enhancing Patient Privacy and Data Security in Remote Healthcare Monitoring Using IoT and Wearable Technologies" is a new approach to healthcare IT's major privacy and data security issues. Security must be updated as wearable gadgets and the Internet of Things (IoT) becomes increasingly widespread in remote healthcare tracking. Many people worry about online patient data security; thus, this study develops a thorough security solution that fits with current healthcare IT systems. A full security architecture with cutting-edge encryption techniques, real-time data transmission protocols, and flexible privacy safeguards is used. The recommended solution outperforms current security methods. A stronger 256-bit key protects patient data at a higher security level. Getting connection latency down to 20 ms speeds up remote healthcare systems. The proposed technique is resilient enough to withstand hostile attacks while maintaining healthcare services. The approach also allows real-world data analysis while preserving patients' identities 92% of the time. The strategy may be employed in complex healthcare IT since it balances data security and research. Overall, this study's findings are promising for safe medical technologies. The recommended method's superior encryption, quicker transmission, and reliable system have raised telehealth tracking privacy requirements. In healthcare IT, wearable technology and the Internet of Things are connecting swiftly. Better security procedures that prioritize patient privacy and data protection are outlined in this study

Paper ID- 495

TRANSFORMING MULTINATIONAL ENTERPRISES IN A FRAGMENTED WORLD THE INTERSECTION OF INDUSTRY 4.0 TECHNOLOGIES AND GEOPOLITICAL DYNAMICS IN FINANCE AND OPERATIONS

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The Global Resilience Integration Model is a major strategy adjustment. It illustrates how multinational firms are addressing Industry 4.0 and geopolitical risks. This brief overview of GRIM's key features and achievements demonstrates how it has transformed foreign commerce. Integrating, protecting, being adaptable, open, working together, and upholding ethics are GRIM's priorities. GRIM handles the complexity of a divided society using blockchain, AI, and dynamic economic flexibility algorithms. One model can leverage several data sources. This offers decision-makers a complete view of the globe at any moment. In today's linked world, stringent security measures are needed to protect international financial operations' privacy and integrity. Blockchain technology is a safety precaution. Open choice: GRIM's dynamic economic freedom program allows firms to adjust their financial strategies as the economy changes. This strategy encourages openness and morality by applying AI-ethics governance frameworks to help companies take greater responsibility. After this drawing, GRIM is a game-changer for worldwide corporations. By integrating Industry 4.0 technologies with global variables, GRIM will transform global businesses

Paper ID- 497

OPTIMIZING SECURITY PROTOCOLS FOR IoT IN HEALTHCARE TO ENSURE PRIVACY IN SMART PATIENT MONITORING SYSTEMS

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The Internet of Things (IoT) might improve healthcare. Smart patient tracking systems may benefit. There are many networked gadgets, creating new security risks. Privacy and accessibility of patient data require strong security measures. This paper addresses this requirement by proposing a comprehensive hospital IoT security approach for patient-tracking smart devices. Our solution's stringent methodology uses contemporary encryption, blockchain, and machine learning-based anomalous detection. This combination aims to provide a full security system for all assaults. Healthcare IoT is complicated and ever-changing; hence, this is essential. The introduction emphasizes the need for patient data security in smart tracking systems to set the stage for constructing and evaluating the recommended security design. The study's security design outperforms current techniques in several key aspects. The recommended approach outperforms Triple DES (88%), RSA (85%), AES (90%), and SHA-256 (88%), with a security level of 95%. This new approach computes in 4 milliseconds, much faster than Triple DES (7 milliseconds), RSA (5 milliseconds), AES (6 milliseconds), and SHA-256 (8 milliseconds). These data demonstrate that the proposed security architecture is superior and can secure hospital IoT. In the ever-changing world of healthcare IoT, the recommended response protects patient data safety and accuracy in smart patient monitoring systems.

Paper ID- 498

PIONEERING PRIVACY-FIRST APPROACHES IN IoT HEALTHCARE WITH SECURE WEARABLE MONITORING SYSTEMS

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In the world of IoT healthcare right now, protecting the privacy of patients' medical data collected by wearable tracking devices is an urgent and important issue. It is very important that this condition be met. The Secure Health Data Aggregation and Homomorphic Encryption (SHAHE) method is being thought about as a possible alternative while this investigation is going on. We thought about the need for processing, data collection, and access control as we worked on the SHAHE approach. We can fully reach this goal by using homomorphic cryptography and safe aggregation methods. The main goal of the program is to protect people's privacy by making data value analysis better and reducing unauthorized access to important health information. This is the reason why the program was made

Paper ID- 500

HYBRID MACHINE LEARNING AND DEEP LEARNING MODELS FOR MENTAL STATE CLASSIFICATION USING EEG AND ECG SIGNALS

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EEG and ECG signals are electrographic measures of brain and heart activity respectively and can indicate neurological states and mental task states. In this paper, we present an enhanced approach of a set of novel temporal features such as energy, Shannon energy, entropy, and temporal energy with state of the art machine

learning classifiers to distinguish relaxing from task oriented cognitive states. We besides explore deep learning methods including Convolutional Neural Networks (CNNs) and Long Short Term Memory (LSTM) networks, for their capacity to recognise complex characteristics within EEG and ECG patterns. We used a publicly available dataset from physionet.org consisting of 36 (male and female) subjects with 21 channels (20 EEG plus 1 ECG). We found that no measure besides Random Forest outperformed all other traditional methods, with 99.34% accuracy. However, deep learning models continued to improve classification, specifically by extending into fusion of multi-modal signals and extraction of temporal features, suggesting the promise of real time cognitive state monitoring. Our results provide a direction for utilizing machine learning and deep learning jointly to improve mental state classification and task performance

Paper ID- 504

ADVANCED COMPARATIVE ANALYSIS OF TIME-FREQUENCY SIGNAL PROCESSING TECHNIQUES AND MACHINE LEARNING MODELS FOR OPTIMIZED BIOMEDICAL CLASSIFICATION

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This research aims at comparing the performance of TF analysis in classifying biomedical signals, with special reference to ECG and EEG signals using PhysioNet database as the major source of data. Fourier Transform and Wavelet Transform, are used to extract the feature from signals for the time-frequency analysis. These features are then used for classification using the algorithms like Random Forest and Neural Networks. All computations are performed with SciPy, NumPy, and Scikit-learn libraries. The study assesses the methods considering the classification performance, computational cost, and interpretability toward determining which approaches offer the best solution for the biomedical signal classification. It needs to be mentioned that the presented results are aimed at helping researchers and practitioners in choosing proper methods for biomedical applications of ECG and EEG signals, focused on the PhysioNet database.

Paper ID- 505

ADVANCED DEEP LEARNING FRAMEWORK FOR DECODING EMOTIONAL STATES THROUGH TEMPORAL AND SPATIAL ANALYSIS OF AMBIENT SOUNDSCAPES

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The paper focuses on creating an efficient system that can predict the subject's emotional state through analyzing sound environment. Thus, we use open-source audio datasets of various environments including cafes, parks, and libraries that are labelled as calm, anxious, and joyful. Audio traits are described by using Feature extraction techniques in librosa Python packages inclusive of Mel-frequency cepstral coefficients (MFCCs) as well as the spectral centroid. The characteristics obtained from the soundscape are then used to develop CNNs and RNNs for emotions recognition from soundscape characteristics. The proposed models are evaluated on the hold-out data to ascertain the reliability, and the accuracy of the emotions predicted. The findings provide information about acoustic features associated with certain emotions. It has the possibility of monitoring and identifying subjective state 24/7 usage in smart homes, health care settings, and city planning

Paper ID- 507

URBAN VERTICAL FARMING WITH IoT AND PRECISION MONITORING FOR A SUSTAINABLE FUTURE

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The fast expansion of population worldwide and urbanisation had been estimated to have 80 % of the population in urban areas in the upcoming 50 years leads to an exponential rise in demand of food. These needs provide an urgent call for developing novel approaches to achieve global food demands amid sustainability problems. Urban Vertical Farming (UVF) offers an attractive solution for growing crops in the vertical dimension of structures, the urban skyscrapers, where land use is limited. However, it is fairly limited research which applies the current state of art in cutting edge technologies such as the Internet of Things, to try to automate and monitor farm processing. Thus, in this review paper, gaps in existing research, the potential for IoT enabled vertical farming, as well as challenges such as energy use, economic feasibility and urban policy integration are examined. Vertical farming can be enhanced through resource efficiency, scalability and level of sustainability through the use of IoT systems and AI driven data analytics which will also help promote urban food security. The research gives a summary of the current state, technological capabilities, and potential way forward in the process of successful vertical farming implementation in urban sets

Paper ID- 513

AI-ASSISTED DATA MODELING AND HIGH-RESOLUTION IMAGE SYNTHESIS: AN INTERACTIVE FRAMEWORK WITH LATENT DIFFUSION MODEL VISUALIZATION

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In this research paper, we present the design and implementation of an AI assisted interactive framework for data modeling and high resolution image synthesis that leverages both state of the art latent diffusion models and visualisation of the real-time algorithm. The system proposed enables user to be able to better understand complex data modeling processes and creates high resolution images in the latent space using diffusion. The framework is both interactive, allowing modifications in parameters and real time visualization of change, making it a useful tool both for educational and for advanced AI research. In this paper, we also discuss the underpinning AI-assisted data modeling algorithms, and why they enable efficient data manipulation as well as high quality image synthesis then provide simulation results and practical applications to illustrate the capabilities of the framework of visualizing the latent diffusion process and generating high resolution images

Paper ID- 514

FLOOD PREDICTION AND ADAPTIVE FARMING SOLUTIONS USING IoT, MACHINE LEARNING, AND REMOTE SENSING FOR CLIMATE-RESILIENT AGRICULTURE

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Flood is one of the most disastrous natural disasters to the people of agriculture, people and infrastructure. Mitigation of these risks and promotion of climate resilient agriculture depends on accurate flood predictions and progressive farming strategies. This paper presents an integrated model consisting of Internet of Things

(IoT) sensors, Machine Learning (ML) and Remote Sensing technologies to provide precise, real time flood prediction and adaptive farming options. Using advanced deep learning algorithms and real time sensor data to predict and risk assess floods in real time, the model leverages real time satellite based Synthetic Aperture Radar (SAR). Another function of the model is to offer adaptive farming solutions including optimized irrigation, flood resilient crop selection, and disaster recovery recommendations for regions impacted by the disaster. A hybrid AI technique assimilating the social media data, and blockchain for integrity of data is more effective to make decisions for the local authorities and farmers. This study seeks to fill the gaps in interdisciplinary collaboration, data scarcity and governance and provide a solution for flood management and sustainable agriculture as a whole

Paper ID- 515

ADAPTIVE INDEPENDENT COMPONENT ANALYSIS FOR BLIND SOURCE SEPARATION IN MULTI-SPEAKER ACOUSTIC ENVIRONMENTS WITH ENHANCED NOISE RESILIENCE

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BSS stands for blind source separation is an important method to unmix the resulted speech signal when multiple speakers are involved in the audio signals. This research deals with enhancing the use of Independent Component Analysis (ICA) with particular emphasis on issues of preprocessing and analysis of simultaneous speech occurrence in complicated environments. The NOISEX-92 database was used which is a multi-speaker recording with noise and then ICA algorithms are applied using the programming language Python with Scikit-learn tools. Using an ICA approach, the mixed signals were reversed into their original and independent parts, which should correspond to different speakers. The performance of the separated speech signals was analyzed based on measures such as signal to noise ratio (SNR), and perceptual evaluation of speech quality (PESQ) to effectively demonstrate the success of the method for separating speech sources. The implications of the findings are that ICA should improve source separation in real-world environments and future research into speech enhancement, teleconferencing barren sophisticated automatic speech recognition systems.

Paper ID- 516

ENHANCING EMOTION RECOGNITION FROM SPEECH SIGNALS USING DEEP LEARNING AND OPEN-SOURCE DATASETS

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In this work, we focus on emotions from speech signals using deep learning methods on the RAVDESS database. The audio signals are preprocessed by means of sampling, normalization and the subsequent feature extraction in the form of Mel Frequency Cepstral Coefficients (MFCCs). Classification of emotions is then performed using a Convolutional Neural Network often abbreviated as CNN. The model's performance is therefore measured with performance metrics including accuracy, precision, recall, and F1 score, to give a measure of the model's capabilities in detecting emotions from voices. The results of the confusion matrix analysis help to understand better the ability of the model to predict different emotions. The analysis proves the significance of deep learning approaches, for example, CNNs that significantly outperform classical approaches in terms of emotion recognition rates. The study also finds out the audio features, which have very high impact in the classification of emotions and contains finding that will be useful for further improvements of affective computing.

Paper ID- 517

DETECTING DECEPTIVE NARRATIVES IN SOCIAL MEDIA USING ADVANCED NATURAL LANGUAGE AND SIGNAL PROCESSING TECHNIQUES

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The recent spread of fake news through social media has raised very crucial issues of information credibility. The current study presents an employ of signal processing methodology, natural language processing (NLP) for the scheduling of the fake news detection system. The Kaggle Fake News Challenge dataset is used in this research; it provides a rich set of news articles labeled as fake and real. The proposed technique has been called NLP-Signal Fusion, and it applies TF-IDF and wordPEDES for the extraction of textual features from the opinion and sentiment data. Sentiment analysis is used as feature extraction method in this context in order to detect the affective content which fulfils the aim to suggest markers of deception. Logistic regression and neural networks classifiers are applied to categorize the news articles. The targets I employed to perform the model assessment include accuracy, the receiver operating characteristic- area under curve, and the confusion matrix. The integration of signal processing with NLP optimizes the fake news detection and provides new avenues for understanding the differences between anything fake news in social medial.

Paper ID- 520

EMPLOYING MACHINE LEARNING TO DRIVE INNOVATIVE STRATEGIES FOR ENHANCED ORGANIZATIONAL PERFORMANCE

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Talent Forge ML is up against six other HR management methods that are thought to be the best in the business. People in business think these tactics are the best. Here are a few examples of these plans: the Intelli Hire method and the Classic Screen method. Talent Forge ML is the name of the method that combines HR management with machine learning. The goal of this study is to investigate the methods so that we can better understand them. Our main goal is to come up with new ideas that will help our company run more efficiently. The Inclusive Workplace (IWP) program, the Competence Acquisition (PTA) method, and the Dynamic Skill Development (DSD) algorithm are thought to be three of the most important algorithms in Talent Forge ML.

Paper ID- 525

EXPLORING OF THE IMPACT OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICES ON MANUFACTURING FIRMS' PERFORMANCE THROUGH DIGITAL TRANSFORMATION

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For Green Supply Chain Management (GSCM) practices to be implemented as efficiently as possible, it is crucial to carefully evaluate and choose the critical success factors(CSF's). An integrated framework based on the Analytic Hierarchy Process (AHP) and Interpretive Structural Modelling (ISM) is presented in this study to

assess important success factors for the GSCM implementation. Along with the categories, the following criteria were devised for the selection of crucial GSCM factors: business, organizational, technical, social, economic, and environmental. The model is developed using a leather manufacturing industry located in North India. Based on the determined weights, AHP is used to choose the optimal criteria from the different Critical Success Factors (CSFs) given under the categories. In order to model the link between the different CSFs and choose the best one from the created matrix, ISM and Matriced' impactscroisés multiplication appliquéean un classment (MICMAC) analysis are used. The findings show that "government support," "environmental teamwork," and "support from senior management for environmental activities" are the key CSFs for achieving Green supply chain management implementation.

Paper ID- 533

THE ROLE OF MEDICAL INFORMATICS IN FACILITATING EVIDENCE-BASED HEALTHCARE PRACTICES

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Medical knowledge, technology, and data have changed healthcare. A new method, Optimized Clinical Decide (OCD), is transforming evidence-based healthcare and achieving this critical goal. To treat OCD, it is critical to use medical data as well as cutting-edge algorithms and learning systems that evolve over time. This strategy effectively addresses the long-standing issue of incompatible healthcare data sets, making it perfect for data integration. OCD's dynamic learning engine is continually adding new patient data to the knowledge base, guaranteeing that healthcare practitioners have the most up-to-date patient health information. Modern healthcare relies on decision-making aid, and flexible decision optimization techniques enhance it by providing patient-specific guidance. OCD's ability to use cutting-edge medical knowledge and promote lifelong learning are its assets. Advanced analytics and personalized patient outcome prediction methodologies increase forecasting and prognosis. The proposed strategy makes use of mobile health resources and is appropriate for the present era of patient-centered treatment. MEPCC promotes patients to work together on health-care decisions. Traditional approaches suffer with adaptability, data integration, and decision support. Optimized Clinical Decide addresses these challenges and increases patient involvement. According to evidence, OCD has the ability to transform healthcare. This enhances our mission of providing educated, specialized, and collaborative patient care.

Paper ID- 574

DESIGN AND ANALYSIS OF SOC INTERCONNECT BASED AMBA AXI4.0

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AMBA AXI was developed by ARM in 2003 upgrading it to AMBA AXI 4.0 in 2014. AMBA AXI4.0 is a fast, efficient, high frequency, high performance, high bandwidth SOC (system-on-chip) protocol that is used for communication between CPU (central processing unit) and FPGA (field programmable gate arrays). It has five communication channels for reading and writing between master and slave. It supports burst transactions and has handshake mechanism, which makes it suitable for high data transfers rate and for pipeline processing of instructions. It finds applications in various ARM (advanced RISC (reduced instruction set computer) machine) based FPGAs like Zynq-7000, Zynq Ultrascale+, Spartan 7, Arria 10 etc. This work implements the AXI4.0 protocol for communication between master and slave for 32 bits of data transfer and verification of using protocol checker.

Paper ID- 614

TRENDS AND METRICS IN ANDROID MALWARE DEVELOPMENT: A COMPREHENSIVE ANALYSIS

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This research provides a detailed analysis of trends and metrics in the development of Android malware based on a dataset spanning from 2012 to 2022. I examine key metrics including file count, lines of code (SLOCs), number of functions, programming languages used, development effort, development time, team size, complexity, maintainability, and comment density. Our findings reveal significant increases in malware complexity and development costs over time, highlighting the evolving sophistication of Android malware. Insights into code quality metrics suggest areas for improvement in maintainability and clarity of malware codebases.

Paper ID- 671

PERFORMANCE ANALYSIS OF ADVANCED STEP CHANNEL FinFET STRUCTURES WITH ASYMMETRY AND SOURCE POCKET ENGINEERING

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This work presents a detailed analysis of three advanced FinFET structures: the Symmetrical Source Step Channel Double Gate FinFET (SSSC-FinFET), the Asymmetrical Source Step Channel Double Gate FinFET (ASSC-FinFET), and the Asymmetrical Source Pocket Implanted Step Channel Double Gate FinFET (ASPSC-FinFET). The study evaluates the impact of structural variations on the primary device parameters, such as threshold voltage, subthreshold slope, and on/off current ratio, by detailed analysis of energy band diagrams, electric field distributions, and drain current characteristics. The results show that asymmetry and pocket implantation significantly improve the device performance. Structure 3 (ASPSC-FinFET) shows the lowest threshold voltage of 0.111 V, the highest on-current of 0.23 mA, and an excellent on-to-off current ratio of 112,575, showing improved carrier injection and reduced short-channel effects.

Paper ID- 692

DEPLOYMENT OF ONTOLOGIES AS KNOWLEDGE REASONING TECHNIQUE FOR MAKING AUTONOMOUS ROBOTS: A SURVEY

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Knowledge Representation and Reasoning (KR & R) is a burgeoning subject in the realm of Artificial Intelligence. Its primary objective is to depict data pertaining to a certain field, especially for use in path planning applications. Utilising ontology-based methods for knowledge representation and reasoning enhances understanding of the environment for task processing. Ontology is a valuable instrument for gathering knowledge pertaining to the environment, events, and actions. This enhances the efficacy of path planning and the autonomy of robots. Knowledge reasoning approaches are essential for dynamically deducing novel conclusions, particularly in non-deterministic situations. This work thoroughly investigates the process of representing information using ontology and analyses reasoning techniques that play a vital role in path planning. Furthermore, we offer a comprehensive analysis of several planned domain description dialects, ontology editors, developers, and robot simulations systems in the subsequent sections.

Paper ID- 707

THE PROPAGATION OF ULTRASONIC WAVE IN PHENOL

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The study investigates ultrasonic wave propagation in phenol and water, focusing on velocity determination and adiabatic compressibility calculations. Using an ultrasonic interferometer and high-frequency generator, the experimental observations reveal notable differences in ultrasonic velocities and compressibility for the two liquids. The results show higher ultrasonic velocity and compressibility for water compared to phenol. This analysis provides valuable insights into the acoustic and molecular properties of the studied liquids, contributing to advancements in material characterization through ultrasonic techniques

Paper ID- 809

LATEST ADVANCED ARTIFICIAL INTELLIGENCE METHODS FOR MACHINE LEARNING MODEL-BASED PREDICTIVE PARKINSON'S DISEASE IDENTIFICATION

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For these treatment and test data to have any significance or importance in the context of Parkinson's disease, the measures of the extent of the disease are hence quantitative, consistent, and repeatable. For the last half-century, a subjective emotional measure has governed human understanding of the phenotype of the disease during routine clinical visits. The work aimed to develop and validate artificial intelligence models for the identification of Parkinson's disease. The paper uses modern machine learning approaches to design an identification model for Parkinson's Disease tested on its subjects. Researchers employed an integrated dataset that combined clinical, genetic, and neuroimaging data for the diagnosis and control of Parkinson's disease. The performance on a predictive model implemented for better diagnostic accuracy and efficacy is used. The supervised learning algorithms Random Forest, Deep Neural Networks, and Support Vector Machines/SVM are exercised for the analysis and pattern recognition with PD. In this way, the possibility to point out several of the most important diagnostic

Paper ID- 830

BIBLIOMETRIC PERSPECTIVES INTO GEOSPATIAL RESEARCH AND AI IN FARMING

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Put another way, the application of advances like AI and RS is basically required in basic areas like horticulture to evaluate rural reasonableness, optimize efficiency, and after that bolster maintainable advancement beneath expanded challenges from climate alter and populace weight. In other words, human expertise—accumulated by counterfeit intelligence—may realize long term of horticulture. The ponders of bibliometrics and surveys of AI and GIS applications in farming are displayed within another work. In arrange to recover thousands of papers distributed between 1992 and 2024, the regarded Scopus database was processed utilizing the VOSviewer program and the Scopus online tool. Findings: The discoveries show a drift for the number of distributions to extend all through this time. Soil and Planetary Sciences is the foremost critical field, inaccessible detecting is the essential source, and India and the Joined together States are the two most effective countries.

Paper ID- 835

CREATING SEMANTIC SOCIAL MEDIA PLATFORM WITH ONLINE APPROACHES

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A greater or lesser number of individuals connected to the internet by using a certain kind of social networking site. Semantic Web technology is employed nowadays in the context of playing a very important part on these sites since they include a vast quantity of data about individuals, pages, events, locations, businesses, and many more. In this study, a Semantic Web application is built with the goal of creating Socialpedia, a brand-new semantic social community. It links social public information that is already available to the public to that which is new; thus, it is linked to various web fragments to create a new massively multi-amount data container. With the use of Semantic Web approaches, process the data container into machine-understandable information. This holds promise for usage in integrated data for improvements in Web search and Web scale data analytics compared to social or traditional search engines. In order to extract structured data in triples

Paper ID- 841

COMBINING SEMANTIC WEB WITH IOT FOR MEDICAL FACILITIES IN SMART CITIES

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Thus, there is a constant demand for improvement in health care systems. The capacity to integrate and exchange the vast quantities of gathered clinical data is crucial to the creation of new and better biomedical products. The true challenge in achieving this aim is not just information collection but also making information analysis interfaces comprehensible. Semantic Web technologies, which provide standards and interoperable rich semantic information for intelligent applications, may be used in this regard. The rest of the document is organized as follows: An introduction of the issue and the several popular study paths within the domains of SW and health are provided in Section 2. To be more specific, we go over ontologies in healthcare, how SW technologies are used to represent patient records, healthcare systems that use SW, interoperability issues arising from heterogeneous health-care data, how to integrate Internet of Things techniques into smart semantic health-care systems, and an overview of security methodologies based on SW. The report ends with several difficulties for future research. The foundation

Paper ID- 914

A STRONG AND ADAPTABLE WATERMARKING METHODOLOGY FOR RELATIONAL DATABASES

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Watermarking technique refers to discreet embedding of an imprint to establish possession of the plagiarism. The current databases watermarking methods lack the ability to self-adapt to various kinds of information & exhibit inadequate robustness. The article introduces a novel and resilient initiative for watermarking databases. The plan has the capability of adapting the watermarking technique & variables to suit the particular features of

quantitative & textual information. We have successfully demonstrated the effectiveness and reliability of our approach through both theoretical analysis & empirical validation, particularly in regards of its resilience & minimal information deformation. This feature renders it appropriate for objectives such as safeguarding plagiarism, identifying owners, or tracking potential traitors.

Paper ID- 917

DEEP LEARNING BASED SMART HOME

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Deep Learning Model-Based Smart Home Controls and Safety System That Is Smarter and More Intelligent Safety of people and things is essential for a better quality of life. A lot of success has been made in smart house technology and its use to make life easier, safer, more comfortable, and more secure. With the rise of innovation as well as the Internet of Things (IoT), home protection, tracking, and controlling machines from afar have all gotten better over the internet. Several home control systems have been made that can keep an eye on what's going on inside and let the owner know about it. Home control systems already on the market can detect movements and keep an eye on things to keep your home safe. However, it is still very hard to avoid getting alerts that aren't needed or are fake. Smart home technology works well when it responds and watches over itself intelligently. This paper shows a clever automated home that can handle home machines, keep an eye on the environment, and find movement inside and outside the house. According to the movement trends that are found, a model based on deep learning is suggested for motion detection and classification.

Paper ID- 931

A COMPREHENSIVE REVIEW OF BIG DATA'S ROLE IN MANAGING NATURAL DISASTERS

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The big data era has undoubtedly created new opportunities for managing natural catastrophes, particularly due to the wide range of possibilities it offers for visualizing, evaluating, and [1] forecasting disasters. This viewpoint suggests that has fundamentally altered how human civilizations adopt natural catastrophe management measures to lessen human. In reliant on top priority is to make the most of big data by collecting information in a variety it that will allow for effective use of it at various. [2] The purpose of this study was to conduct a thorough assessment of the literature in order to analyses here technology stands in terms of offering practical and useful solutions to t. The article has given the study results of a number of researchers on various scientific and technical aspects that are relevant to the effectiveness of big data in aiding the management of natural disasters. [3] This paper reviews the main big associated accomplishments in various, support relief.

Paper ID- 935

EXPLORING PRICING, TRADING, AND PROTECTION IN THE BIG DATA MARKET

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Big data is regarded as the secret to releasing the following massive surges of economic development. In light of a variety of new apps and platforms that are integrated into our everyday routines, such as smartphones and tablets, social access networks, and Website of Things-based automated devices, the quantity of data being gathered worldwide has been growing exponentially (smart grid, smart transportation, smart cities, etc.). How to effectively use the data has become a crucial problem due to the overall rise of data. This necessitates the creation of a big data market that facilitates effective data sharing. Data proprietors and users can interact with each other, share, and increase the usefulness of data by moving it into the smartphone industry as a sort of product. The creation of a marketing server and going to trade ploys that maximize the people's benefits of income to buy while maintaining high - quality and anonymity, as well as measures to prevent the decided to trade data from it being resold in order to preserve the software's value, are barriers that must be overcome in allowing such a lead to customer satisfaction for data making trades. In this article, we perform a thorough analysis of the data lifetime and data collection. To be more precise, we first investigate a broad range of payment systems, classify them into various categories, and carry out a thorough analysis of the benefits and

Paper ID- 984

PERFORMANCE ANALYSIS OF CHANNEL ENGINEERED GAA-TFETs FOR OPTIMIZED DEVICE DESIGN

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This paper provides an extensive evaluation of the characteristics of the proposed Gate-All-Around Transistor (GAATFET) made of silicon (Si), silicon-germanium (SiGe), and germanium (Ge) as channel material considering most relevant device metrics in the form of ON current (Ion), OFF current (Iof f), subthreshold swing (SS), threshold voltage. Based on such analysis, the channel material Ge shows to achieve maximum, which places Ge among the best for such applications, whereas SiGe and Si channel devices offer minimum, providing efficient suppression of leakage currents. The lowest SS was determined for SiGe (23.1 mV/dec), thereby increasing the switching efficiency of this compound, whereas the highest value of SS is recorded by Ge, with 40.3 mV/dec due to the relatively narrow bandgap of the latter. The threshold voltages varied between 0.66 V for Si and 0.84 V for Ge and lie at 0.712 V for SiGe. The present findings stress the importance of material selection in channel materials to optimize the performance of GAATFETs for specific applications. Si excels in energy-efficient designs with minimal leakage, Ge dominates in high-performance scenarios requiring high drive current, and SiGe emerges as a versatile choice, balancing power efficiency and performance.

Paper ID- 1036

A COMPREHENSIVE REVIEW OF ADVANCED ANALYTICS FOR PREDICTING HRQoL IN CANCER SURVIVORS USING A SYNERGISTIC APPROACH

Vaishnaw Gorakhnath Kale [1] ***, Pravin Ramdas Kshirsagar*** [2] ***, Bhuvan Unhelkar*** [3] ***, Chakrabarti*** [4] ***, Dr.Kamal Upreti*** [5] ***, Rituraj Jain*** [6]

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This systematic review explores the role applied and emerging methods including AI, Explainable AI and Quantum machine learning techniques in the prediction of Health-Related Quality of Life (HRQoL) of cancer survivors. It also gives possible benefits and limitation of using the advanced analytics to predict the HRQoL. In all, 141 research papers implemented in the last fifteen years with focus between the years 2008 to 2023 are analyzed. For the convenience, this literature review is divided into four primary categories – (i) Artificial intelligence, (ii) Explainable artificial intelligence, (iii) Quantum machine learning, and (iv) Synergistic integration. The third way the present systematic review paper differs from other papers in the domain is that the paper offers a direction of future research. Furthermore, the hypothetical illustration is provided in order to compare outcomes of the synergistic approach with the existing data. Consequently, this analysis provides beneficial insights for further research and development of the synergistic approach in both research and clinical practice. The assessment shows that there is a continued need for research focusing on improving the quality of life of those that survived cancer.

Paper ID- 1037

AADS : AN AUTOMATED ACCIDENT DETECTION AND NIGHTTIME SURVEILLANCE SYSTEM USING FINE-TUNED YOLOV10 DEEP LEARNING TECHNIQUES

M. Karthikeyan [1] ***, Pravin Ramdas Kshirsagar*** [2] ***, Tan Kuan Tak*** [3] ***, Keshav Lalit*** [4] ***, Dr. Kamal Upreti*** [5] ***& Rituraj Jain*** [6]

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Computer vision-based surveillance is very important today's security systems to detect, track and regulate the security much better than standard cameras. However, like any other performance measurement systems they have potential pitfalls and technical, ethical, and legal implications must be well understood. The continuous rise in connection and interaction implies that safety of the public especially when navigating roads or operating in public domains is paramount. The conventional approaches to accident identification include observation or reporting from witnesses and always record slow and imprecise outcomes. With the improvement of AI and computer visions, especially with deep learning models such as YOLO, accident detection is changing. YOLO v10 which is incorporated in the surveillance systems, performs real time video analysis to provide object and pattern recognition of accidents including car accidents and incidents involving the pedestrians. When applied to the initial set of annotated accident images, the fine-tuning of the YOLO v10 model enhances its detection

capability. The system is in watching the video frames that contain aberrations and issues and alarms are issued when the accidents happen and relayed to the monitoring stations or emergency departments for proper response. The optimized YOLOv10 here delivers a meaningful testing score of 72.3% mAP to outperform the regular YOLOv10 efficiency in incident detection.

Paper ID- 1038

AN ALGORITHMIC APPROACH TO INTRUSION DETECTION IN AD HOC WIRELESS NETWORKS BASED ON ARTIFICIAL INTELLIGENCE

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The self-configured, autonomous, and framework-free modes of communication that mobile adhoc networks (MANETs) offer have revolutionized our culture. As a result, efforts have been made to explore ways to maximize the potential of MANETs through increased and improved utilization. Standards for AI have been developed thanks to the most recent release of new machine learning technologies. Different security-related issues from malware assaults affect mobile ad hoc networks (MANETs). Any node operates as a router to move data without centralized control, making nodes more vulnerable to threats from other nodes or attackers because of their brief existence. Because of this, MANET needs particular security policies to detect the incorrect entrance of misbehaving nodes. If all nodes are self-assured and correctly collaborate, the networks function better. The paper presents a practical artificial intelligence algorithm-based security system that uses AdaBoost and DT algorithms to recognize and identify packet falling nodes, classify information packets as normal or abnormal, and detect insider threats in real-time. The results showed that DT performed better than AdaBoost, with a 98% accurate prediction rate. Consequently, DT is better able to recognize damaging attacks in MANETs.

Paper ID- 1039

A TRANSFER LEARNING BASED DEEP LEARNING FRAMEWORK FOR LUNG DISEASE DETECTION UTILIZING CXR IMAGES

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The classification of various lung diseases with the help of chest X-ray images is one of the most significant and challenging issues in medical imaging applications. This work proposes a transfer learning-based deep neural network architecture to classify lung diseases using a publicly available dataset. The proposed DenseNet201 model aims to leverage the interconnected structure to optimize feature transmission, minimize computation redundancy, and improve the gradient flow. The proposed model achieved a better classification accuracy of 98.34% compared to the other existing methods. These results show that DenseNet201 effectively learns discriminative features from the input medical image data. The proposed framework is suitable for large-scale implementation of lung disease classification. It helps develop more efficient computer-aided diagnostic systems, assisting clinicians in decision-making.

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