SUSTAINABLE DEVELOPMENT GOALS

1th INTERNATIONAL CONFERENCE ON

Holistic Approaches to Achieve Sustainable Development Goals with Artificial Intelligence (ICASDGAI -2025)

ORGANIZED BY

Uttaranchal Institute of Technology
Uttaranchal University
Premnagar, Dehradun-248007
Uttarakhand, India

14th - 15th
January, 2025

SOUVENIR

ICASDGAI -2025

MESSAGE FROM THE PRESIDENT

It is with great pride and joy that I extend my warmest greetings to all participants of the 1st International Conference on Holistic Approaches to Achieve Sustainable Development Goals with Artificial Intelligence (ICASDGAI-2025). This groundbreaking event represents a significant step toward leveraging the transformative potential of artificial intelligence to address global challenges and advance the United Nations' Sustainable Development Goals (SDGs).

The conference theme, focusing on the holistic application of AI in achieving sustainability, reflects the commitment of Uttaranchal University to fostering innovation, research excellence, and interdisciplinary collaboration. I am confident that the discussions and deliberations at this conference will generate new ideas and innovative solutions to tackle complex global issues.

I am particularly delighted at the release of this Souvenir, which chronicles the knowledge, experiences, and innovative practices shared by distinguished experts from academia, industry, and policymaking.

I wish ICASDGAI-2025 resounding success and hope it will pave the way for future endeavors in this critical area.

Shri Jitender Joshi

President, Uttaranchal University

MESSAGE FROM THE VICE PRESIDENT

It is a privilege to welcome all participants, delegates, and speakers to the 1st International Conference on Holistic Approaches to Achieve Sustainable Development Goals with Artificial Intelligence (ICASDGAI-2025). This event provides a valuable platform for interdisciplinary collaboration, fostering dialogue on the application of AI to achieve sustainability and equity on a global scale.

The conference not only aims to explore innovative solutions but also emphasizes ethical AI practices, inclusivity, and responsible development. By bringing together experts from diverse fields, ICASDGAI-2025 serves as a catalyst for progress toward a better, more sustainable future.

I commend the efforts of the organizing team for their dedication and vision in making this conference a reality. May the discussions and ideas exchanged during these two days inspire groundbreaking contributions to the field.

Wishing everyone an intellectually enriching experience.

Ms. Ankita Joshi

Vice President, Uttaranchal University

MESSAGE FROM THE VICE CHANCELLOR

It is my distinct pleasure to welcome to the 1st International Conference on Holistic Approaches to Achieve Sustainable Development Goals with Artificial Intelligence (ICASDGAI-2025). This conference exemplifies Uttaranchal University's commitment to advancing research and innovation that address critical global challenges.

The theme of the conference highlights the transformative potential of artificial intelligence in tackling interconnected issues such as poverty, health, education, climate action, and economic growth. I am confident that the knowledge shared here will contribute to meaningful advancements in sustainable development and AI-driven solutions.

I extend my heartfelt congratulations to the authors, reviewers, sponsors, speakers, and organizing committee members for their tireless efforts in making this event a success. May this conference ignite ideas and foster collaborations that leave a lasting impact on the academic and global community.

I wish ICASDGAI-2025 great success and look forward to the outcomes of this remarkable gathering.

Prof. (Dr.) Dharam Buddhi

Vice Chancellor, Uttaranchal University

MESSAGE FROM THE PRO VICE CHANCELLOR

It gives me immense pleasure to extend my warmest greetings to all attendees of the 1st International Conference on Holistic Approaches to Achieve Sustainable Development Goals with Artificial Intelligence (ICASDGAI-2025). This conference serves as a unique platform for global researchers, industry experts, and academicians to explore how artificial intelligence can drive sustainable solutions for the challenges we face today.

The conference theme underscores the critical role of interdisciplinary collaboration in harnessing AI for addressing the multifaceted goals of the United Nations' Sustainable Development Agenda. By promoting ethical practices, fostering inclusion, and innovating sustainable technologies, ICASDGAI-2025 aligns with Uttaranchal University's mission to be a leader in education, research, and social responsibility.

I extend my gratitude to the organizing team for their dedication and the distinguished speakers, authors, and participants for their contributions. I am confident this conference will inspire thought-provoking discussions and foster partnerships that pave the way for transformative outcomes.

Wishing the conference great success and all participants a productive and enriching experience.

Prof. (Dr.) Rajesh Bahuguna

Pro Vice Chancellor, Uttaranchal University

MESSAGE FROM THE EXECUTIVE DIRECTOR, STUDENT AFFAIRS AND IT

It is a privilege to welcome you to the 1st International Conference on Holistic Approaches to Achieve Sustainable Development Goals with Artificial Intelligence (ICASDGAI-2025). This event marks a significant milestone in leveraging cutting-edge AI technologies to address the global challenges outlined in the Sustainable Development Goals (SDGs).

As the Executive Director for Student Affairs and IT, I take great pride in seeing Uttaranchal University host such a forward-thinking conference. The event not only highlights AI's potential to create equitable and sustainable solutions but also inspires our students to embrace innovation, ethics, and social responsibility in their academic and professional pursuits.

I commend the efforts of the organizing committee and the contributions of participants from around the world. Your ideas, research, and discussions will undoubtedly set the stage for impactful collaborations and breakthroughs in this critical domain.

I wish ICASDGAI-2025 grand success and hope it will serve as a catalyst for meaningful change and progress.

Dr. Abhishek Joshi

Executive Director, Student Affairs and IT
Uttaranchal University

MESSAGE FROM THE DIRECTOR, UIT

On behalf of the organizing committee, it is my pleasure to welcome you to the 1st International Conference on Holistic Approaches to Achieve Sustainable Development Goals with Artificial Intelligence (ICASDGAI-2025). Serving as the Program Chair and Convener for this prestigious conference has been an honor and a privilege.

This conference would not have been possible without the vision of our Hon'ble Chancellor Shri Jitendra Joshi and Hon'ble Vice Chancellor Prof. (Dr.) Dharam Buddhi, who continually inspire the academic community to push boundaries in research and innovation.

I extend my heartfelt gratitude to the authors, reviewers, and technical committees who have contributed to the success of this event. Special thanks go to the organizing team and volunteers, whose hard work has brought this conference to fruition.

May ICASDGAI-2025 serve as a beacon of innovation and collaboration in the pursuit of sustainable development.

Prof. (Dr.) Sumit Chaudhary

Director - UIT, Uttaranchal University

MESSAGE FROM THE ORGANIZING CHAIR

It is with great pride that I welcome you to the 1st International Conference on Holistic Approaches to Achieve Sustainable Development Goals with Artificial Intelligence (ICASDGAI-2025). Organizing this conference has been an incredible journey, marked by the dedication and enthusiasm of the entire team.

The conference's theme emphasizes the need for ethical, inclusive, and interdisciplinary AI applications to address complex global challenges. With its blend of keynote presentations, panel discussions, and technical sessions, ICASDGAI-2025 provides an invaluable platform for the exchange of ideas and the creation of impactful solutions.

I am deeply grateful to our Hon'ble Chancellor Shri Jitendra Joshi and Hon'ble Vice Chancellor Prof. (Dr.) Dharam Buddhi for their constant support and guidance. My heartfelt thanks go to the organizing committee, volunteers, and all contributors who have made this event possible.

I wish all participants a productive and inspiring experience and look forward to the remarkable outcomes this conference will undoubtedly achieve.

Dr. Rajiv Kumar

Organizing Chair, ICASDGAI-2025

PREFACE

It is with immense pleasure and pride that we welcome you to the 1st International Conference on Holistic Approaches to Achieve Sustainable Development Goals with Artificial Intelligence (ICASDGAI-2025), scheduled to be held on the 14th and 15th of January, 2025. This landmark event is a celebration of innovation, collaboration, and the transformative power of artificial intelligence (AI) in addressing the pressing challenges of our time—the United Nations' Sustainable Development Goals (SDGs).

The genesis of ICASDGAI-2025 stems from the growing realization that sustainable development requires a multidimensional approach. AI, with its vast potential to analyze complex systems, predict outcomes, and optimize solutions, offers unprecedented opportunities to tackle challenges across diverse domains such as poverty, health, education, climate action, and economic growth. The conference aims to bridge gaps between disciplines, foster ethical AI practices, and ensure inclusivity in leveraging AI for global betterment.

As a hybrid event, ICASDGAI-2025 brings together a diverse group of participants from academia, industry, policymaking, and civil society. Through this platform, we hope to spark meaningful dialogues, forge impactful collaborations, and inspire actionable solutions. The papers and presentations featured in this conference are a testament to the pioneering research, innovative applications, and emerging trends that are shaping the future of sustainable development.

The souvenir you hold in your hands is a reflection of our collective journey toward sustainability and innovation. It captures the essence of the conference, celebrates the contributions of our esteemed participants, and serves as a repository of knowledge and inspiration for the global community.

We extend our heartfelt gratitude to the distinguished speakers, authors, reviewers, sponsors, and organizing committee members whose efforts have made this conference a reality. Together, we embark on a mission to harness the power of AI in creating a sustainable, equitable, and prosperous world for generations to come.

We wish you an enriching and transformative experience at ICASDGAI-2025 and look forward to the collective impact this gathering will generate.

Warm regards
Prof. (Dr.) Sumit Chaudhory
Organizing Committee Head
ICASDGAI-2025

Holistic Approaches to Achieve Sustainable Development Goals with Artificial Intelligence

The 1st International Conference on Holistic Approaches to Achieve Sustainable Development Goals with Artificial Intelligence (ICASDGAI-2025) highlights the transformative role of artificial intelligence (AI) in advancing the United Nations' Sustainable Development Goals (SDGs). This pioneering event is dedicated to exploring how AI can be effectively leveraged to address the world's most pressing challenges—poverty alleviation, climate action, equitable education, healthcare access, and sustainable economic practices—through ethical, inclusive, and interdisciplinary strategies.

The Holistic Role of AI in Sustainable Development

The conference underscores the need for a systemic approach to sustainable development, emphasizing the interconnectedness of the SDGs and the importance of collaborative solutions. AI's ability to analyze, predict, and optimize provides an invaluable toolkit for developing innovative and scalable solutions across sectors.

Key Focus Areas

1. Ethical and Responsible AI Practices

-Addressing AI biases to promote fairness and inclusion.
-Frameworks for data privacy, transparency, and security.
-Diversity in AI development to ensure equitable benefits.

2. Environmental Sustainability with AI

-AI applications in climate change mitigation, renewable energy, and biodiversity conservation.
-Sustainable urban planning, waste management, and agriculture powered by AI.
-Marine and ocean sustainability as well as forestry and land management through AI-driven strategies.

3. Social Equity and Inclusion

-AI to reduce inequalities and empower marginalized communities.
-Enhancing gender equality, inclusive education, and healthcare access.
-Cultural and linguistic inclusion, youth empowerment, and social justice through AI.

4. Economic Growth and Innovation

-Fostering entrepreneurship and sustainable industries with AI.
-Smart cities and infrastructure optimization.
-Financial services, workforce development, and job creation in the AI age.

OUR VISION

ICASDGAI-2025 envisions AI as a catalyst for creating a sustainable, inclusive, and prosperous world. By fostering dialogue among researchers, policymakers, industry leaders, and practitioners, the conference seeks to build a global network committed to harnessing AI for the greater good.

Through this event, we aim to demonstrate the importance of collaboration, innovation, and ethical responsibility in shaping AI-driven solutions that address the complex and dynamic challenges of sustainable development. Join us in this transformative journey to rethink possibilities, inspire change, and drive collective action for a better future.

ACKNOWLEDGEMENT

The successful organization of a conference is the culmination of months of dedication, collaboration, and tireless efforts by numerous individuals and teams. We express our heartfelt gratitude to our

Hon'ble President, Shri Jitendra Joshi; Hon'ble Vice President, Ms. Ankita Joshi; and Hon'ble Vice Chancellor, Prof. (Dr.) Dharam Buddhi, whose unwavering support and vision have been instrumental in the realization of this event.

We extend our sincere thanks to Prof. (Dr.) Sumit Chaudhary (Director-Engineering, Uttaranchal University) for his steadfast encouragement and guidance. His inspiring leadership has consistently motivated the academic community of students and faculty to pursue excellence in research and innovation.

Our deepest appreciation goes to the members of the Advisory Committee, Technical Program Committee, Technical Committee, Anchor Committee, Digital Publicity Management Committee, Registration Committee, Sponsorship Committee, Session Management Committee, Hospitality Management Committee, and Publicity, News, and Media Committee. Their hard work, commitment, and meticulous attention to detail have been the backbone of this conference's success.

We are profoundly grateful to our publication partner, Brazilian Journal of Biosystems Engineering (Bioeng), Zanco Journal of Pure and Applied Sciences (Zjpas), Advanced Sustainable Science, Engineering and Technology, Asian Journal of Chemistry, and Experimental and Theoretical Nanotechnology for their collaboration in ensuring the publication of high-quality research papers in SCOPUS-indexed journals.

To everyone who contributed to making this conference a resounding success—thanks you for your dedication, enthusiasm, and support. Your collective efforts have made this event a meaningful and memorable experience.

CHIEF GUEST

Shri Pankaj Gupta

President, Industries Association of Uttarakhand, Dehradun

Mr. Pankaj Gupta is a distinguished entrepreneur and a highly regarded leader in the industrial and trade sectors of Uttarakhand. With a B.Sc. in Electronics, he has made significant contributions to the growth of industries and MSMEs in the state. As the President of the Industries Association of Uttarakhand and several other prestigious organizations, Mr. Gupta is a champion for industrial development, sustainability, and social responsibility.

Mr. Pankaj Gupta has held prominent leadership roles, exemplified by his tenure as President of multiple organizations, including the Shree R.K. Gupta Memorial Trust and Pokhri ITI. His influence extends to being a Director at the State Industrial & Infrastructure Development Corporation of Uttarakhand. Moreover, as a member of numerous national and state-level advisory boards, committees, and councils, he has significantly contributed to policymaking and fostering industrial growth across the region.

An accomplished author, Mr. Gupta has made substantial contributions to industrial and trade knowledge through his influential publications. His works, such as the MSMED Act 2006 and the Development Road Map for Uttarakhand, reflect his commitment to empowering the industrial sector and setting a strategic direction for sustainable development.

His contributions have been widely recognized, earning him several prestigious accolades, including the Rashtriya Udyog Ratan Award (2008), Honor of Uttarakhand (2010), and the Uttarakhand Gaurav Samman for his excellence in environmental protection. His relentless efforts in the MSME sector and his involvement in voluntary blood donation initiatives have also garnered significant appreciation.

Mr. Gupta's commitment to corporate social responsibility is evident in his active participation in green initiatives, such as developing a “Green Road” in Dehradun. He has organized impactful workshops, disaster relief programs, and capacity-building projects for schools and industries, reflecting his dedication to community development and sustainability.

In addition to these contributions, Mr. Gupta has been instrumental in organizing high-profile international and national events, such as Ambassadors’ Meets and Vendor Development Programs. These initiatives have significantly boosted industrial

KEYNOTE SPEAKERS

Dr. Jinsong Wu
Senior IEEE Member, Chile

Prof. Anand Nayyar
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Duy Tan University, Vietnam

Dr. Ayodeji Olalekan Salau
Afe Babalola University in the
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Prof. Dr. Noor Zaman Jhanjhi,
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Degree Programmes, Taylor's University,
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PUBLICATION PARTERNS

Brazilian Journal of Biosystems Engineering (BIOENG)

ZANCO Journal of Pure and Applied Sciences (ZJPAS)

Advanced Sustainable Science, Engineering And Technology

Asian Journal of Chemistry

Experimental and Theoretical Nanotechnolo

Apple Academic Press

Bentham Science Publishers

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1ST INTERNATIONAL CONFERENCE ON HOLISTIC APPROACHES TO ACHIEVE SUSTAINABLE DEVELOPMENT GOALS WITH ARTIFICIAL INTELLIGENCE (ICASDGAI -2025)

Uttaranchal Institute of Technology
Uttaranchal University
Dehradun-248007, Uttarakhand, India

DISCLAIMER

ABSTRACT

AI Techniques for Emotion Recognition in Multi-Speaker Conversations: Challenges and Solutions

Rajiv Kumar (Uttaranchal University)*

Artificial Intelligence (AI) has ushered in a new era in the study of human communication through speech signals. This survey paper delves into three popular methods for extracting meaning from individual interactions: speaker identification, emotion recognition, and dialectization (determining who said what). We examine how AI can enhance these techniques by transitioning from traditional to advanced deep learning approaches. This chapter explores the advantages and drawbacks of different methodologies, highlighting challenges such as background noise, overlapping speech, and cultural variations in the expression of emotion. Furthermore, we explore how combining these methods can lead to a deeper comprehension of dialogues. Finally, we discuss evaluation metrics and relevant datasets that are freely available while also offering recommendations for further research in this rapidly evolving field.

Sentiment Analysis in Product Reviews

Mukhtiar Singh (Chandigarh University- Mohali); Harshit . (Chandigarh University); Nikhil Thakare (Chandigarh University); Dipak Rajbhar (Chandigarh University)*

In today's competitive e-commerce landscape, understanding customer sentiment is crucial for success. Code-mixed language, which involves using multiple languages in a single sentence or conversation, is increasingly prevalent in product reviews, especially among multilingual communities. Traditional sentiment analysis techniques struggle to handle the complexity of such data, necessitating more advanced methods. This paper explores the challenges of analyzing code-mixed sentiment in product reviews and how modern natural language processing (NLP) techniques can address them. It delves into the theoretical foundations, the development of sentiment analysis models specifically designed for code-mixed text, and compares their performance with standard models. Using a dataset of 5,000 code-mixed product reviews, this study demonstrates how machine learning models can effectively capture customer sentiment.

Automated Scene Text Detection: A Comprehensive Analysis

Inderjeet Singh (Chandigarh University) *; Mohit Gupta (Chandigarh University); Parvez Rahi (Chandigarh University Mohali Punjab); Akshit Bansal (Chandigarh University); Arpit. (Chandigarh University)

Detecting and recognizing textual content in pics are crucial components in automated systems that extract textual statistics from complicated environments. This paper presents a whole evaluation of an Automated Scene Text Detection System that leverages advanced Optical Character Recognition (OCR) tools, which includes Pytesseract, EasyOCR, and Keras-OCR, to deal with real-world annoying conditions. These OCR structures depend upon today's deep reading fashions, with a focus on Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs), which permit the extraction and recognition of textual content from numerous images featuring diverse fonts, orientations, and lights conditions. The observe emphasizes the mixture of Keras-OCR, combining CRAFT (Character Region Awareness for Text Detection) and CRNN (Convolutional Recurrent Neural Network) to deal with textual content with odd shapes or distortions correctly.

Comparative Review of Lexicon-Based and Machine Learning Approaches in Sentiment Analysis for Product Reviews

Prashant Yadav (Chandigarh University)*; Manu Tomar (Chandigarh University); Mukhtiar Singh (Chandigarh University- MOHALI)

Sentiment analysis is essential for deciphering user viewpoints in product evaluations and provides organizations with useful consumer feedback insights. Lexicon-based methods and machine learning techniques are two popular approaches to sentiment analysis that are reviewed and compared in this study. Lexicon-based approaches rely on predefined sentiment lexicons, providing interpretability and simplicity but struggling with context-specific challenges such as sarcasm and domain-specific terms. In contrast, machine learning approaches, especially supervised and deep learning models, adapt to complex language patterns, offering higher accuracy but requiring significant labeled data and computational resources. This review explores the strengths and limitations of both approaches, discusses hybrid techniques, and assesses their applicability in product review analysis. The paper concludes by highlighting emerging trends and improving sentiment analysis in e-commerce.

MOST: Multi-oriented Scene Text Detector using Localization Refinement

Abhishek Shrivastav (Chandigarh University); Parth Gupta (Chandigarh University)*; Krish Sangwan (Chandigarh University)

Text detection in natural surroundings is essential for many real-world applications, including augmented reality, document digitalization, autonomous navigation, and scene interpretation. Conventional scene text detectors are limited in their capabilities by the premise that text can only appear in forms that are horizontal or nearly horizontal. Noticeable performance drops occur while reading text in diverse orientations, such as curved or rotated forms. To address these issues, we propose the Multi-Oriented Scene Text Detector (MOST), a deep learning-based method that recognizes text in any orientation. Convolutional neural network (CNN) framework of MOST integrates orientation-aware components to effectively anticipate and localize multi-oriented text. Our approach integrates angle prediction, region proposal networks (RPNs), and multi-scale feature extraction to handle complex scenarios with varying text orientations.

AI-Based Early Detection of Parkinson's Disease Using XGBoost Classifier

Anuj Kumar (Chandigarh University)*; Abhijeet Gupta (Chandigarh University); Aman Sharma (Chandigarh University); Aryan Mehta (Chandigarh University); Anupama Jamwal (Chandigarh University)

Parkinson's disease (PD) is a chronic illness leading to nervous system deterioration, making timely diagnosis critical. This work presents an ML model, specifically an XGBoost classifier, for early PD diagnosis. To enhance performance, Recursive Feature Elimination is used for selecting key features, while GridSearchCV helps identify optimal hyperparameters. The dataset comprises voice measurements of biomedical relevance, indicating vocal dysfunction linked to PD. The model's effectiveness is evaluated using accuracy and time complexity metrics, with advanced feature selection

techniques applied to predict early-stage samples. This AI-driven approach offers a valuable tool for further exploration of AI in neurodegenerative disorders.

Reinforcement Learning Based Recommendation System: An In-Depth Review of Models and their Limitations

Nipun Dahiya (MPSTME, NMIMS); Dhaval Mehta (Mukesh Patel School of Technology Management and Engineering)*; Ishaan Atre (MPSTME, NMIMS); Soni Sweta (MPSTME NMIMS Mumbai)

This paper surveys the landscape of the AI model approaches and algorithms that have been in use in recommendation systems, which have become an essential requirement in enriched user experiences, ranging from e-commerce to content streaming and social media, among other areas. We focus on a few remarkable techniques: Multi-Armed Bandit, Multi-Agent Reinforcement Learning with Deep Deterministic Policy Gradient (DDPG), Deep Q-Network (DQN), Proximal Policy Optimization, and Twin Delayed DDPG. Every model is discussed in detail for the purpose of demarcating the merits and demerits, besides shedding light on some major findings of past literature. We enumerate some important research gaps in the domain that relate to scalability, adaptability to dynamic user preferences, and context-awareness. We therefore hope that we may get insight into the success of such algorithms in diverse environments and applications.

Potato Leaf Disease Detection using CNN

Rakesh Kumar (Tula's Institute)*

The potato is a very usable vegetable in India and Asia. It crucial agricultural crop globally, and its yield can be compromised by a range of diseases, particularly those affecting the leaves. Leaf diseases must be promptly identified and accurately diagnosed in order to limit their spread and minimize possible output losses. Convolutional Neural Networks (CNNs) show great potential in picture categorization recently, especially in the identification of plant diseases. In order to forecast potato leaf diseases, this study presents a CNN-based technique. The technique uses a CNN model that has already been trained and fine-tuned using a collection of photos of potato leaves that are sick and healthy, including those with early and late blight. The final model has the ability to categorize fresh photos of potato leaves as either healthy or unhealthy.

AI-Driven Disaster Management Response Using Twilio Messaging Service and Chatbot Integration

Anant Joshi (BRACT's Vishwakarma Institute of Information Technology)*; Kirti Dighole (BRACT's Vishwakarama Institute Of Information Technology); Utkarsha Baraskar (Vishwakarma Institute Of Information Technology)

An Early Warning System, powered by AI, has come into being to enhance community resilience against inundation occurring with regularity at Katraj, Pune. Estimates produced by Random Forest model, including factors such as intensity of rainfall, altitude, and the distance from water bodies, highlight real-time flood hazard zones. In addition, it gives information about the proximity of healthcare services, supermarkets, and essential services ordered by distance with respective links to

Google Maps for their posture. Using a geolocation with ML will provide timely insights to the residents in tip-top fashion that can be in and around saving them from an early stage to ensure their safety during the crisis. With Twilio's inclusion for WhatsApp notification, it extends and offers a wider outreach and is therefore able to inform the users on all important alerts and detailed information as they receive those on their phones.

Hostel Hub - Hostel booking website

Rudra Sheth (Vishwakarma Institute of technology)*; Rishika Samargade (Vishwakarma institute of technology Pune); Shantanu Satange (Vishwakarma Institute of Technology); Aryan Salunkhe (Vit pune); Yash Shendage (Vit pune)

This paper introduces a website that offers strong, real-time information about majority of the Hostels and student residences near particular educational institute in a particular area. Basically designed for students who come to away places for studies or other miscellaneous reasons. For more residential details, it gives information about the residence address and redirects us to Google Maps providing us the locations and directions of the residence. Not only this website gives us direction to the residence but also provides us the whole and sole information about the amenities provided, and ensures us about the frequently asked questions that are generated in one's mind while selecting a residence in a faraway place. Additionally, we also provide a facility to reserve a place through our website at the desired residence chosen by the user.

Towards Intelligent Surveillance: Real-Time Anomaly Detection for Enhanced Public Safety Using a Deep Learning Approach

Sharanbabu B (Panimalar Engineering College)*; Santhosh P (Panimalar Engineering College); Subedha Varatharaj (Panimalar Engineering College)

Surveillance cameras ensure security in public and private spaces by capturing continuous footage, though reviewing it manually is time-consuming. Traditional monitoring relies on human oversight, which can lead to errors like neglect and improper camera setup, resulting in missed crime detections. This research proposes an automated anomaly detection system using CCTV feeds to alert law enforcement of unusual activities. The system leverages an Autoencoder Neural Network on Kaggle's UCF Crime Dataset and processes multiple camera inputs in real time with OpenCV. Accessible via a web dashboard, it sends SMS, email, and status alerts upon detecting anomalies. Tests show 99.5% detection accuracy, making it viable for real-world security applications.

SIDAS: Smart Incident Detection and Alert System

Santhoshkumar V (Panimalar Engineering College)*; Raj Kumar M (Panimalar Engineering College); Subedha Varatharaj (Panimalar Engineering College)

Urban futurist,derivative of a famous quotation, reveals that SIDAS is transforming the face of urban safety.The system applies YOLOv8 object detection that is trained on 5,000 photographsfor every kind of incident.focusing the attention of the system to vehicle collisions, falls,and the presence of firearms.The saved and live footages can be detected by the system at a speed of 25-30 frames per second;it was determined that the system is within the range of 65-95% accuracy to identify if there

were events taking place. The system is connected through Roboflow for scalable deployment and fast alerts via email and SMS upon the detection of an incident. Indeed,it is the most revolutionary approach in how computer vision and artificial intelligence can make life in public places safer. SIDAS promised a safe city environment with forward-thinking,intelligent handling of incidents while resolving the problems of cities at the same time as laying the grounds for future smart city technology.

Real – Time Medical Report Analysis and Virtual Assistance

Rakesh M R (Panimalar Engineering College)*; SHYAM V (Panimalar Engineering College); Subedha Varatharaj (Panimalar Engineering College)

The web application addresses patients' reliance on doctors for medical test result interpretation, reducing the stress of waiting for consultations. Patients can upload scanned medical reports, which are analyzed using OCR to extract test names and values. An AI-powered system then processes the data to provide a summary indicating if the results are normal or need urgent attention. Additionally, the Medical Chatbot answers health-related questions; offers diet plans, and general medical advice. A medical test library provides descriptions of biomarkers and their normal/abnormal ranges, helping patients understand their health in real-time.

Implementation of Bluetooth Controlled Commercial Seven Segment Display Panels using Android Application

Sukesh M (NMAM Institute of Technology)*

Numeric signs are the main means of display in banks, foreign exchange, jewelry shops, schools, hospitals, petrol bunks, parking lots, queue token and commodity exchanges till date. But it is a tedious work to change the values every now and then, manually. The proposed system provides a solution to this problem where we by using Bluetooth based Android application to change the numeric values on numeric sign boards through a smart phone. Android application is made with user friendly graphical interface to change the numeric values. The system encompassed with three different units, namely, display control unit, decoder board and display board. The security feature is provided to access the display control unit using a 4-digit password.

A Wide Assistance on Location-Crises Based Web Application

Balaji S (Panimalar Engineering College)*; MD AEJAZ (Panimalar Engineering College)

This paper presents a web application designed to serve as a unified platform that provides essential assistance during crises. The application enables users to access critical information, connect with vital services, and participate in coordinated efforts for effective response and recovery. Key features include real-time emergency alerts, mapping to locate critical resources (such as shelters, medical facilities, and relief centers) and seamless communication with service providers like ambulances and repair centers. The web application leverages SQL for data access and management, ensuring efficient service in emergencies.

Crop Price Prediction Using Prophet Model

Parnish Sharma (SRM Institute of Science and Technology)*; Mohammed Dohadwala (SRM Institute of Science and Technology)

Accurate crop price prediction is vital for agricultural stakeholders—farmers, traders, and policymakers—who use it for decisions on production, market strategies, and resource allocation. This paper explores using Facebook's Prophet algorithm to predict crop prices based on a dataset from the United Nations FAO(1961–2022), covering 73 crops in categories like fruits, vegetables, pulses, and cereals. We evaluate Prophet's performance using **Mean Absolute Error (MAE)**, achieving **97.3% accuracy**. The paper also discusses challenges in long-term forecasting and Prophet's strengths and weaknesses. Findings suggest that Prophet holds significant potential for time-series forecasting in agriculture, improving decision-making and market stability.
Keywords: Crop price forecasting, Prophet Model, FAO dataset, time series forecasting, agriculture.

Image Processing for Malaria Detection and Leukocytes Classification in Microscopic Blood Smears

Sharanbabu B (Panimalar Engineering College)*; Rakesh M R (Panimalar Engineering College); Ramana K S (Panimalar Engineering College); Ranjith Kumar A (Panimalar Engineering College); Subedha Varatharaj (Panimalar Engineering College); Danish Quamar (Mizoram University); Ambeth Kumar V D (Mizoram University)

Malaria, a deadly disease caused by Plasmodium parasites transmitted through mosquito bites, is typically diagnosed by visually examining blood smears under a microscope to detect infected red blood cells (RBCs) and classify white blood cells (WBCs). This manual process, however, is time-consuming and prone to human error. Accurate RBC identification in blood smears is crucial for malaria diagnosis, treatment, and patient health monitoring. To address these challenges, our research introduces an automated image recognition model that uses machine learning and neural networks to classify leukocytes and detect malaria in microscopic blood smear images. By training the model on a large dataset, we achieve high accuracy in distinguishing between healthy and infected cells, supporting timely and precise patient health assessments. This automated approach enhances detection speed and reliability, aiding in medical decision-making.

Lung Disease Detection using CNN on X-Ray & Tissue Images

Ramana K S (Panimalar Engineering College)*; Ranjith Kumar A (Panimalar Engineering College); Subedha Varatharaj (Panimalar Engineering College)

Lung diseases cause significant global health issues, making early diagnosis essential for effective treatment. This project uses a Convolutional Neural Network (CNN) to classify lung conditions from chest X-rays, aiming to improve diagnostic speed and accuracy. The system analyzes images to categorize conditions like Lung Adenocarcinomas, Lung Squamous Cell Carcinomas, Obstructive Pulmonary Disease, Pneumonia, Tuberculosis, and normal lungs. Preprocessing techniques enhance image quality and consistency, while the CNN model extracts key

features to ensure precise classification. This tool offers healthcare providers a reliable, efficient means to support early diagnosis and better clinical decisions for pulmonary diseases.

Enhanced Academic Assessments Using BERT and Top Sampling for Student Performance Optimization

Yuktha Boggula (New Horizon College Of Engineering)*; Vempalli Charitha (New Horizon College of Engineering); Harshini Atmakuri Raja (New Horizon College of Engineering); Bollam Munna Suprathik (New Horizon College of Engineering)

In modern education, traditional manual grading of subjective assessments is often time-consuming, inconsistent, and prone to bias, posing challenges for both educators and students. The "Enhanced Academic Assessments Using BERT and Top Sampling for Student Performance Optimization" project addresses inefficiencies in traditional grading, which is time-consuming and biased. This model automates subjective exam grading using BERT to ensure fair and consistent evaluation, eliminating human biases. The system also uses Top Sampling to generate personalized quizzes tailored to each student's performance, supporting adaptive learning by addressing individual knowledge gaps. This AI-driven approach reduces educator workload, delivers timely feedback, and enhances the overall learning experience, fostering improved academic outcomes through more efficient, consistent, and personalized assessments.

Real-Time Dynamic Matching For Urban Express Delivery Systems

Md Aejaz (Panimalar Engineering College)*; Kavitha Subramani (Panimalar Engineering College); Balaji S (Panimalar Engineering College); Nithish Kumar (Panimalar Engineering College); Micheal Antony (Panimalar Engineering college); Naveen Kumar (Panimalar Engineering College); Venkatesh Karthik (Panimalar Engineering College); Kishore Kumar (Panimalar Engineering College)

This paper introduces a dynamic matching system for urban express delivery, aimed at optimizing real-time transportation between providers and recipients using Enhanced Matching Algorithms (EMA). The proposed system leverages cryptographic techniques to secure data transmissions and SQL operations to manage delivery-related information. Providers add delivery items with relevant details, which are then processed by the system for cost calculations, route planning, and secure communication. Once authorized by the administrator, the system triggers notifications to the recipient about the delivery status, confirming each transaction with cryptographic verification. The architecture integrates state-of-the-art hashing and encryption to protect data integrity. Testing includes white-box, black-box, and system validation to ensure seamless operations. Future work involves integrating cloud storage for scalability and optimizing communication protocols for increased system efficiency.

Unlocking Employee Satisfaction: Reinventing the Role of E-HRM Systems in Small and Medium-sized Enterprises

Yashwant Bisht (Uttaranchal University)*

The impact of digital human resource management systems in SMEs is examined in this study. The role of digital technologies in SMEs in Hungary is researched. The satisfaction of the employees is dependent upon the E-HRM dimension systems like E-recruitment & selection, E-learning & development, E-training, E-performance appraisal, and E-compensation. Employee motivation has acted as the mediating factor in the conceptual framework of the study. In this study, the data is collected from 608 employees working in the SMEs from the literature is analyzed using SPSS on the basis of a multiple regression mediation model under mediation effect and found that all the dimensions of digital HRM are significantly impacting employee satisfaction. However, E-recruitment could not find any significance when mediated by motivation. Overall, employee satisfaction is affected by digital HRM practices directly and through employee motivation in SMEs in Hungary.

Real-Time 3D Face Recognition with Deep Learning-based Face Mesh Detection

Ashraf Bano Jigar (Velagapudi Ramakrishna Siddhartha Engineering College)*; Shaik Kaif (Velagapudi Ramakrishna Siddhartha Engineering College); Keerthi K (V R Siddhartha Engineering College)

A real-time 3D face recognition system utilizing face mesh detection based on deep learning is presented in this report. Robust and effective facial recognition in a variety of contexts is made possible by the suggested method, which combines the accuracy of deep learning models with the efficiency of real-time processing. The MediaPipe Face Mesh model, a cutting-edge deep learning architecture that can accurately identify face landmarks, is used by the system. The algorithm creates rich feature representations for every face by taking the identified landmarks and extracting detailed 3D facial geometry. Deep neural networks are then used to classify these representations to recognize faces. The use of three-dimensional facial data improves recognition performance by strengthening the system's resistance to changes in lighting, occlusion, and posture.

Governance of AI: Policies and Frameworks for Sustainable Development

Sukesh Kumar Bhagat (Uttaranchal University Dehradun, Uttarakhand)*

The development of the AI technology is demonstrating exponential rate and features both opportunity and threat for sustainable development. The requirement for good governance structures will essentially emerge as more artificial intelligence programmers involves multiple sectors, to guarantee the new innovation append added worth and works positively toward numerous dreams in society while controlling potential dangers of the technology. As a result, in the present paper particular emphasis is made on the contemporary approaches to the AI governance that implies polices and frames for the AI improvement towards the sustainable development goals.

Optimizing Exotic Option Pricing: Monte Carlo Simulation and Variance Reduction Techniques

Srinivas Raju Gottimukkala (Deere & Company)*

This study investigates the pricing of exotic options, specifically Barrier and Asian options, through the application of Monte Carlo simulation. The research commences by establishing the theoretical foundations and closed-form solutions within the Black-Scholes framework. Subsequently, three distinct random walk models are introduced to generate underlying asset paths for simulation purposes.

The antithetic variate technique is demonstrated to significantly reduce standard error and accelerate convergence in the pricing of both options, thereby enhancing the precision of Monte Carlo estimates. Notably, the selection of underlying random walk models is found to have a minimal impact on accuracy, suggesting avenues for further research in advanced variance reduction techniques. This study provides valuable insights into the pricing of exotic options, offering implications for finance professionals and researchers, and driving innovation in option pricing methodologies.

Evaluating the Impact of Fed and Domestic Monetary Policies on Long-Term Government Bond Yields

Srinivas Raju Gottimukkala (Deere & Company)*

This paper investigates the secular decline in real interest rates and the potential influence of central bank monetary policy on long-term government bond yields, focusing particularly on the US Federal Reserve (Fed). While various demand-side and supply-side explanations, such as ageing populations, lack of investment opportunities, and reduced productivity growth, have been proposed for this decline. To explore if similar patterns exist in other advanced economies, this study constructs 3-day monetary policy decision windows around the 10-year government bond yields for selected countries, using both domestic central bank decision dates and those of the Fed. The findings suggest that, despite heterogeneity among advanced economies and factors like unconventional monetary policy tools and exchange rate interventions, there is substantial evidence supporting a stronger influence of the Fed's decisions on global bond yields compared to national monetary policies.

Future Scope of Machine Learning and Internet of Things-Enabled Advanced Parking Management Systems in India

Ramnarayan . (Uttaranchal University)*

According to the current scenario, parking is India's biggest challenge. In this article, we will address this issue by developing an automated parking system. Due to increasing the number of cars in India this is major challenge to handle the cost effective car parking system. Indian transportation, car drivers and personal car owner always face the issue to park the car when they are in roaming by a car. The creation of the automated vehicle parking system makes use of enabling technologies including machine learning, the internet of things, and image processing. The primary architecture will show all of the phases that how this system will reduce expenses and time. Car driver always west time to search the parking space manually that means they are wasting time and money in term of fuel. The solution in this paper provides the better policies and automates system and behavior to contribute in the betterment of the society.

Automating Hospitality: Leveraging Robotics for Enhanced Customer Satisfaction in Hospitality Industry

Ramnarayan. (Uttaranchal University) *

Technology, especially robotics can be utilized in hospitality industry to gather the customer feedback. It will also provide the impact of usages of robotics in future to improve the hospitality services. In this section, we review the industrial and academic literature to provide the overall impact of the robot to affect the hospitality industry in future. Industry expert expect the maximum percentage of robotics

utilization in hospitality industry. This paper explains the significance role of robot in customer feedback system for hospitality industry. In this finding this is also explain the adoption rate of the robot by hospitality industry to set a great paradigm industry and academic area. One of the most finding is after use of the robotics in hospitality industry to make the customer-oriented service maintaining faster growth of facility towards the customer and hospitality industry.

Sustainable Development of Advanced Education Systems: The Future of Classrooms and Education Innovation

Ramnarayan. (Uttaranchal University) *

The purpose of the research is to explore the advanced education planning and methods for implementation to facilitate the education 5.O. In this advanced era, education 5.O and classroom 5.O effects on education and society will change the process of teaching and learning methods. In this paper, we will look at the positive effects of technology and its many emotional constraints, which will help us, improve education and benefit society. The use of advances in education to provide a more sophisticated education known as "education 5.0," with a focus on the social and profound developments and arrangements that we make to further develop life in the public light. An innovation-based classroom board asset is any computerized device that takes care of a homeroom issue. There are various sorts of assets accessible on a wide range of computerized stages.

Object Detection for Assisting Blind Individuals Using ESP32-CAM and GPS

Anupam Kumar (Chandigarh University)*; Shashi Mehta (Chandigarh University); Satyam Bharati (Chandigarh university); Jasneet Chawla (Chandigarh University)

The purpose of this study is to develop a conceptual framework of assistive technologies that will help meet the objective of increasing the independence and safety of visually impaired persons. This framework is based on recent innovations in object detection, depth sensing, and communication for real-time spatial awareness and response. To increase efficiency in gathering the environment data the system combines several hardware components such as a high frame rate web camera, infrared depth sensor as well as ESP32-CAM microcontroller board that plays a crucial role in capturing visions and spatial data. The object detection feature, which forms the basis of the system, uses the YOLO algorithm a prominent algorithm in real-time object recognition. From the software side, the sensor inclusion and data treatment are maintained with ordinary C++ of the Arduino-based hardware. The system under development has incorporated real-time GPS tracking.

ADAS-PeVision: Advanced Driver Assistance System for Pedestrian Movement Prediction

Kartik Solanki (Graphic Era Hill University) *; Aman Yadav (Graphic Era Hill University); Vikrant Sharma (Graphic Era Hill University Dehradun); Satvik Vats (Computer Science and Engineering, Graphic Era Hill University; Dehradun,248002, India.)

With the advancement of autonomous vehicle innovation, precise pedestrian movement prediction has become indispensable for ensuring safe interactions between pedestrians and self-driving cars. In this research work, we propose a pedestrian tracking and prophesy framework intent at inflate pedestrian safety in densely populated environment. Our framework leverages state-of-the-art deep learning methodology, notably YOLO (You Only Look Once), for contemporaneous pedestrian detection and pursuit. By scrutinize the trajectories of detected pedestrians; we develop a prognosticative model to foretaste their future movements, thereby enabling self-driving cars to proactively adjust their etiquette to accustom pedestrian actions. To evaluate the efficacy of our approach, we conducted extensive demonstration using a diverse dataset of urban scenarios. Results demonstrate that our framework achieves high accuracy in prophesy pedestrian trajectories, with an average accuracy rate 72%.

Integrating Swarm Intelligence with Deep Learning for Enhanced Social Media Sentiment Analysis

Parminder Singh (Uttaranchal University)*; Saurabh Dhyani (Uttaranchal University); Rajiv Kumar (Uttaranchal University)

In the constantly evolving digital ecosystem, sentiment research is crucial for comprehending user sentiment on social media. This research proposes a hybrid method that integrates deep learning and swarm intelligence feature selection. It aligns with "Industry, Innovation, and Infrastructure" (SDG 9). The technique uses Long Short-Term Memory (LSTM) networks for emotion prediction and “Particle Swarm Optimization (PSO)” for feature selection. At 95.5% accuracy, this model performs better than conventional methods in handling sarcasm, ambiguity, and a range of linguistic patterns. The proposed approach increases sentiment research's accuracy and provides practical insights that promote innovation and economic growth. The results show how hybrid models can be used for complex sentiment analysis across a variety of domains.

Secure File Storage System using Hybrid Cryptography

Aryan. (Chandigarh University, Gharuan, Mohali, Punjab) *; Avi. (Chandigarh University)

Data security is now a critical component in the digital age. Using cryptography, data can be protected against unauthorized access. A method known as hybrid cryptography blends symmetric and asymmetric using cryptography to increase security. In this paper, a hybrid cryptography-based secure file storage system is proposed. The file is encrypted by the system using symmetric cryptography, and the symmetric key is safeguarded using asymmetric cryptography. A symmetric key-encrypted file that the user uploads to the system can be unlocked. After that, the symmetric key is encrypted in the database using the user's public key. The system obtains the encrypted symmetric key from the database
and uses the user's private key to decrypt the file when the user requests to access it. File is divided into N segments. Every single component of the file is encrypted using a distinct algorithm.

Machine Learning-Driven Renewable Energy Selection: A Bibliometric Approach to Align with Sustainable Development Goals

Virendra Rana (The ICFAI University, Dehradun)*; Ram Karan Singh (The ICFAI University, Dehradun)

The current research aims to analyze and predict the appropriate renewable energy using a machine learning model aligned with the Sustainable Development Goals (SDGs). A bibliometric analysis is performed, to select the relevant literature from Scopus and Web of Science databases for obtaining sustainable criteria. The weights of criteria are calculated using the fuzzy Analytical Hierarchy Process. The prediction is performed by a machine learning model using a logistic regression technique employed with fuzzy TOPSIS. The outcomes highlight the criteria, 'Technological Innovation' is of maximum importance, and 'concentrating solar' is the best-suited renewable energy. The proposed energy model provides a blueprint for policy-makers while selecting suitable energy for different regions. Other advanced machine learning techniques can be used for the proposed model to increase the model's performance.

Deep Learning Approaches for Vehicle Damage Percentage Estimation: Using Image Classification Techniques

Ganesh Adithya G (Saveetha Engineering College) *; Gokul K (saveetha engineering college); Deepa T (SAVEETHA ENGINEERINGCOLLEGE); Anjaline Jayapraba (Saveetha Engineering College)

There is a need for an accurate estimate of the percentage of vehicle damage to make insurance claims and assess repair costs. The given paper applies three widespread deep learning architectures, including AlexNet, VGG16, and ResNet, to the problem of the degree of the damage of vehicles on an image. In the case, the authors tried to apply a dataset of vehicle images with different degrees of damage, and each image was accurately annotated by the corresponding percentage of the damage. Also, data augmentation was applied to increase the model performance across a broader range of damage properties. The results reveal that the performance of the ResNet architecture is betterЯ both others. The main contribution of the exploration is the development of more sophisticated algorithms to boost the percent of vehicle damage recognition.

Predictive Maintenance of Industrial Equipment using Machine Learning: Innovations and Practices

Ganesh Adithya G (Saveetha Engineering College) *; Gokul K (Saveetha Engineering College); Deepa T (Saveetha ENGINEERINGCOLLEGE); Anjaline Jayapraba (Saveetha Engineering College)

Predictive maintenance for industry machines is a strategy that saves you from surprise downtime and using efficient operations. In this project, the task of predicting when a particular machine will fail has been performed using data concerning those machines recorded over the past days along with different operational parameters. Through the analysis of these parameters, our model intends to forecast imminent failures beforehand so that interventions can be taken at appropriate moments. By combining such consistent operational data over time with machine learning, it can continuously learn and identify patterns from historical data to predict equipment health. The results of this project can assist industries in identifying the predictive maintenance systems that leverage machine learning and provide timely maintenance diagnosis, supplementary to support production without disruption.

Leveraging Cryptocurrencies and Machine Learning for Sustainable Economic Growth: A Comparative Analysis of Regression Models using PyCaret

Deepti Kiran (ICFAI Business School, The ICFAI University, Dehradun, India)*; Itisha Sharma (ICFAI University)

Accurate cryptocurrency price projections are greatly desired by traders and investors in order to increase earnings and control risk. However, price prediction in time series analysis is a challenging undertaking due to the erratic and unpredictable character of bitcoin markets. The goal of this paper is to present a thorough analysis of several machine learning algorithms for the top five cryptocurrencies, emphasizing the advantages and disadvantages of each strategy. It also looks at how different explanatory variables affect trends in bitcoin prices, providing information on what motivates market movements. The study demonstrates how well several machine learning models predict bitcoin values, making it a useful manual for novices and experts alike. The study looks at and contrasts various models in an effort to determine the best prediction strategies, which will help investors in navigating the cryptocurrency landscape with data-driven strategies that balance innovation & risk.

Comprehensive Deep Learning Framework for Video-based Anthropometric Analysis Using Keypoint Detection and Semantic Segmentation

Shriya Chowdhury (Vellore Institute Of Technology, Vellore)*; Dishanwita Ghosh Chowdhury (Vellore Institute of Technology); Dr.Budhaditya Bhattacharyya (Vellore Institute of Technology)

This study presents a thorough deep learning framework for video-based anthropometric analysis that uses real-time video clips to forecast body mass index (BMI) and related health risks. The framework leverages keypoint detection (MoveNet) and semantic segmentation (DeepLabV3+) models to estimate height and weight for automated BMI calculation. This enables BMI classification across categories like underweight, healthy, overweight, and obese. Through BMI analysis, the system provides a predictive method for medical conditions such as diabetes and cardiovascular disease by evaluating disease risks associated with different BMI categories. For videos, the methodology incorporates a robust video processing pipeline, including frame extraction at regular intervals, body coverage analysis, and iterative cropping to maximize body visibility in selected frames.

Emerging Threats and Vulnerabilities in IoT Networks: A Study on Best Practices for Ensuring Security

Vishwas B (Dayananda Sagar University) *; Arjun BC (Rajeev Institute of Technology)

This article starts by defining the IoT domain and rationalizing the IoT network protection requirement. It then looks at the work other researchers have done, the information they have come up with and the observation that has been made in this line of study. Later it explores threats and information security threats that are unique to IoT networking. After this, it discusses how security

risks within these systems can be prevented to the best of possible. The article ends with a discussion of the vulnerability of IoT networks and future research prospects in this field.

Stress and Health Monitoring

Lokesh Kumar (New Horizon College Of Engineering)*; Dr. Nirmala M (New Horizon College Of Engineering); T.Sharath Chandra Reddy (New Horizon College Of Engineering)

Wearable devices solution for real-time stress and health monitoring, leveraging physiological signals such as heart rate variability, skin conductance, and body temperature. A systematic review of current technologies reveals diverse applications, from simple consumer electronics to sophisticated biomedical systems, designed to enhance mental health management. These devices utilize advanced algorithms to detect stress levels, providing users with actionable feedback to mitigate anxiety and improve overall well-being. Challenges remain, including the need for improved accuracy, user comfort, and data privacy. Future developments in wearable technology promise to integrate more comprehensive health metrics, paving the w ay for personalized health interventions and enhancing the efficacy of stress management strategies in everyday life.

Cognitive Wellness: A Brief Analysis of Brain Health Metrics Across Various Disease Spectrum

Dhulipalla Nagajyothi (VIT-AP University) *

All cognitive and physiological functions are governed by the brain, the body's most complex organ. It governs consciousness, cognition, and behaviour using billions of neurons and complicated electrical and chemical impulses. This complex structure encompasses white and gray matter sections that process, store, and retrieve information. Brain functions and dysfunctions contain around forty neurological diseases. From Alzheimer's to severe traumas and developmental anomalies, these diseases challenge medical understanding and patient well-being. Brain sickness mechanisms, symptoms, and treatments have been studied extensively to understand and treat them. This comprehensive review synthesises research on 26 related illnesses. A comprehensive analysis of 45 papers shows researchers methodologies, hypotheses, and results from numerous domains. Research on neurology and brain disorders is examined in this study to uncover trends and future directions.

Automated Melanoma Detection: A Deep Learning Approach for Accurate Skin Cancer Detection

Utkarsh Tiwari (Uttaranchal University)*; Roosha Shamoon (Uttaranchal University); Isha Ali (Uttaranchal University); Deepa Pandey (Uttaranchal University); Rishabh Shah (Uttaranchal University)

Melanoma should be detected since it has the ability to cause death to an individual once it penetrates the skin. Speaking about it is one of the basic principles of medicine to begin with. Bias can therefore creep into the traditional dermatological manual assessment of patients and it is also a very time-consuming process for them. The study explores the development of other systems which are intelligent and capable of applying deep learning to check for healthy moles by observing some

features like redness or black in color (benign melanoma as opposed to malignant melanoma). It shows that our Convolutional Neural Network (CNN) model is up to 90% accurate at identifying these crucial diagnostic categories amongst skin diseases associated with cancers. This new methodology would help physicians to diagnose this lethal disease earlier and more efficiently, thus enhancing the probability of accurate prognosis of patients' conditions.

AI for a Greener Future: Advancing Sustainable Development and Climate Change Mitigation

Amita Bisht (Uttaranchal University)*

The use of AI in sustainable development practices presents a very big opportunity to address effective transformation and multifaceted challenges of climate change mitigation. In this paper the aim is to explore the potential of AI technologies across various sectors for the sustainable development and mitigation in climate change including energy sector, agriculture, transportation, and waste management system. Highlighting the ability of AI to enhance efficiency, reduce emissions and more. By implementing machine learning algorithms and predictive analytics, ai can optimize resource management, improve renewable energy system, and improve real time monitoring of environment changes. AI technologies offer innovative solutions that can significantly enhance the way of responding towards the challenges. AI can help in modelling and predicting climate related risk, it informs local governments and organizations to implement proactive measures.

Personalized Healthcare 5.0: A Human Centric Approach

Amit Saini (Uttaranchal University, Dehradun)*; Sanjeev kumar shah (Uttaranchal University,Dehradun); Devendra Singh (Uttaranchal University,Dehradun); Sunil Sharma (Uttaranchal University,Dehradun); Pavan Gangwar (Uttaranchal University,Dehradun)

Healthcare 5.0 is a revolutionary approach to healthcare that utilizes cutting-edge technologies to transform patient care and services. It seeks to enhance the entire patient experience by combining critical thinking and precise automation, allowing for hitherto unheard-of levels of collaboration between medical professionals, patients, and machines. Industry 5.0 technologies have the potential to generate new jobs and support inclusive, sustained economic growth across a range of industries, including healthcare, and they also have a knock-on effect that aids in the achievement of SDG 8 and SDG 9. In this paper, we will focus on the potential of artificial intelligence technology in medical diagnostics and diagnosis of complex patterns and hidden structures, as well as manufacturing smart medical parts and implants.

Nexus Retail Recruit Hub: A Novel AI-Driven Platform for Blue-Collar Job Recruitment in India

B Kishore (Sai Vidya Institute Of Technology)*; Chandan V S (Sai Vidya Institute Of Technology); Dr. Ajay V G (Sai Vidya Institute Of Technology); Dr. Shanta Kumar B Patil (Sai Vidya Institute Of Technology)

The Nexus Retail Recruit Hub platform addresses unemployment in India's blue-collar workforce by leveraging AI to deliver accurate job recommendations and improve recruitment transparency. The system integrates advanced techniques such as collaborative filtering, graph-based recommendation algorithms, and fraud detection using YOLOv8 architecture. Its design incorporates features like multilingual support, a user-friendly interface, and mechanisms to build trust by detecting and removing fraudulent job postings. This paper presents a detailed methodology, highlights the limitations of existing systems, and introduces new performance metrics tailored to evaluate blue-collar recruitment platforms. Results from testing across Indian states show significant improvements in job match accuracy, trustworthiness, and user satisfaction.\Index Terms —Blue-Collar Recruitment, Artificial Intelligence, Job Portals, Fraud Detection, Multilingual Support, YOLOv8.

Advancing Sustainability: Circular Economy Approaches and Battery Management Systems for Enhancing Efficiency and Resilience in the Energy Sector

Gopal Krishna (Uttaranchal University)*

Moving to a circular economy provides a paradigm shift addressing key sustainability threats in energy, namely resource depletion and environmental degradation. The review reveals an urgent demand for novel approaches that improve energy efficiency, resilience, and sustainability to waste and convert energy. This paper provides an extensive overview of circular economy principles and approaches with circular economy policy instruments in the area of energy, particularly, in resource recovery from waste, remanufacturing and closed-loop energy systems. Additionally, the role of Battery Management Systems (BMS) is highlighted as a key enabler in optimizing resource utilization and improving energy storage efficiency, further supporting circular economy objectives.

Innovations in Smart Home Energy Management: Using IoT to Build Green Cities

amit kumar (Uttaranchal University,Dehradun)*

Currently, about 44% of the energy produced in the globe comes from fossil fuels, which are hazardous to the environment and public health. A current examination of the global demand for energy consumption across various energy consumption sectors revealed that the building sector is one of the main consumers of energy, with a significant portion of energy consumption being deemed unnecessary. This emanates from mismanagement and following insignificant or strategic approaches meant at averting huge amounts of energy being used .in addition, case examples of smart energy management technology deployments that have been successful are included in the article, together with a discussion of the implementation obstacles and their resolutions. In order to provide public safety, maintain environmental sustainability, reduce traffic waste, pollution threats, resource utilization, energy consumption, and quality of life

Designing a Cutting-Edge AI Architecture for Improved Solar Energy Prediction

Tushar Gupta (Noida International University); Gagan Tiwari (Noida International University); Dr. Kapil Joshi (Uttaranchal Institute of Technology, Uttaranchal University, Dehradun)*

The increasing importance of solar energy has led to the formation of solar forecasting predictive models. Traditional methodologies find it difficult to produce accurate results due to the difficulty of the environment. New innovative AI architectures are required to overcome this challenge of high variance in prediction. This paper works on the growth of present AI architectures for solar prediction. A framework for developing an AI Architecture that is more accurate and precise based certainly on computation strategies and a mixture of disciplines: and adapts is to be developed. The investigation finds flaws, strengths, and strong supports in the current methodologies using numerous hypothetical papers. The full framework is suggested to test accuracy and adaptability and reduce the sensitivity of the proposed method using artificial neural network novel works and improved versions to make it more effortful.

Privacy preserving using federated learning

Vishva R (Karpagam academy of higher education)*; shan afraz (Karpagam academy of higher education); abeeth j (Karpagam academy of higher education); premkumar s (Karpagam academy of higher education)

Federated learning a new direction in machine learning that will allow models to be trained cooperatively on decentralized data sources without any compromise of the users privacy. The sensitive data collected and processed using centralized systems might thus increase the risks of data breach and violations of privacy regulations. FL addresses these issues by ensuring the data remains local on devices and only model update, say, weights or gradients, are communicated to a central server. This project addresses privacy-preserving mechanisms integrated within the federated learning framework, including differential privacy and secure aggregation, and extends it with homomorphic encryption for further protecting individual data. These extensions support both ensuring that raw data is kept local and that updates to the model shared between clients and a central server are protected against inference attacks and privacy violations.

Intelligent Homes 5.0: Inclusion Of Recent Trends And Technology

Sunil Sharma (UIT)*; Amit Saini (UIT); Devender Singh (UIT); Sanjeev Shah (UIT); Mohit Payal (GEU)

The Internet of Things (IoT) is an emerging technology that aims to improve the quality of life of people. The development of smart homes, driven by the demand for a comfortable, human-independent lifestyle, faces challenges in scalability, efficiency, and security. This article proposes a secure and efficient smart home architecture that integrates block chain and cloud computing, utilizing multivariate correlation analysis for network traffic to enhance security and demonstrating block chain's efficiency as a security solution for future IoT networks. The article presents an Industry 5.0 use case that assesses energy consumption and carbon footprint impacts.

NATM Approach to Tunnel Design & Construction

Vinod Balmiki (UIT, Uttaranchal University, Dehradun)*

The New Austrian Tunneling Method (NATM) is a popular and widely used tunneling method for constructing underground tunnels. It was developed in the1960s in Austria and is recognized as one of

the most versatile and efficient techniques for tunnel excavation. NATM involves the use of shotcrete and rock bolting to support the tunnel as it is excavated in small sections rather than removing the entire1960s in Austria and is still widely used today due to its flexibility, adaptability, and suitability for a range of geological conditions. The method is based on sound geological observation and a careful understanding of the rock mass behavior. Additionally, it will highlight some of the successes and challenges of the NATM method in tunneling projects worldwide. Overall, the NATM tunneling method remains a valuable option for tunnel construction and has proven effective in producing long-lasting, safe, and stable underground structures.

The Imperative Role of IoT in Disease Monitoring and Detection in Finger Millet Plant

Shailendra Tiwari (Uttaranchal University)*

Plant disease is a disruption of a plant's normal state that prevents or alters the plant's essential functioning. All plant species, both wild and domesticated, are susceptible to illness. To identify the current improvement in the enhancement of plant disease detection and classification system based on current technologies like Machine Learning, Deep Learning, IoT etc., an organized way to analyze the plant diseases and their various classification models that has been shown. In this paper we have conducted a systematic survey of different technologies used with their classification accuracy. The different applications of ML and DL algorithms such as Genetic Algorithms, K-Means, GAACO, Grab-Cut, Otsu and other popular algorithms.

An Imperative Role of Digitization in Plant Health Monitoring for Sustainability

sakshi koli (Uttranchal University)*

Since crop yield, resource consumption, and sustainability, in general, are all impacted by agricultural practices, monitoring them is essential in modern agriculture. To transform agricultural practices, this article examines how cutting-edge technology might be included in plant health monitoring. We can collect high-resolution, real-time data on important environmental elements and plant health indicators by examining the deployment of cutting-edge sensors, such as spectral imaging, drones, and IoT devices. With the use of these sensors, infections, nutrient deficiencies, and insect infestations can be identified early and monitored accurately and continuously. For instance, minor oscillations in plant reflectance may be visible to multispectral imaging sensors, providing details on nutrient imbalances and
environmental stressors.

Bibliometric Analysis of Crop Diseases Identification through machine learning and Artificial Intelligence technique using VOS viewer

Upasana Rana (Uttaranchal University)*

Despite there had been a lot of research on crop disease detection using machine learning and Artificial intelligence techniques , there had not been a systematic review in this field that show how much work has been done and which area still undiscover for research. The publications related to " crop diseases" and "machine learning" ,"crop diseases" and "artificial Intelligence" were searched in the Scopus from 2010 to 2024. The result shows most of the articles published after the year 2020 that increases growth

rate in publication in the field of crop diseases and machine learning. This study retrieved the information of subject keywords, countries, journals, organizations and authors working majorly in this field. Analysis shows that India holds a dominant position in this field. The further study found that publication on wheat disease detection using machine learning techniques is very less as compare to other crop disease in India.

Integrating Green Technology, Sustainability, and Artificial Intelligence: Pathways to a Sustainable Future

Chandani Sharma (Maharishi Markandeshwar University)*; Preeti Aneja (UPES Dehradun)

The combination of green technology, sustainability, and artificial intelligence (AI) provides new opportunities for addressing environmental concerns and promoting sustainable growth. This paper explores how artificial intelligence (AI) can help achieve sustainability goals and boost green technology advances. The study examines the major application areas of Green Technology and Sustainability related to AI and their impacts including, consumer behavior, urban growth, agriculture, waste reduction, and energy efficiency. This paper investigates the role of AI in advancing green technology and sustainability, identifying key areas where AI can drive positive environmental outcomes and exploring challenges and opportunities in this interdisciplinary domain with research areas involving further scope of development.

Mapping Facial Emotions through Deep Neural Networks

Satyam Kumar (Manipal University Jaipur)*; Anirudh Singh (Manipal University Jaipur); Purusharth Agarwal (Manipal University Jaipur)

Facial Expression Recognition (FER) has experienced significant advancements recently, driven by breakthroughs in machine learning, image processing, and cognitive sciences. This study aims to enhance the precision and effectiveness of FER by delving into the intricacies of facial movement features within static images. Our innovative approach utilizes patch-based Gabor features to automatically capture these nuances, providing a comprehensive understanding of static and dynamic characteristics crucial for robust FER. Notably, our results showcase exceptional performance, with VGG16 achieving an outstanding accuracy of 99.28% in the Emotion Detection Dataset. These findings validate the efficacy of our proposed methodology and emphasize the potential of integrating dynamic facial movement features for superior emotion recognition.

Redefining Justice: The Influence of AI on India's Judicial System

Ravi Kant (ICFAI Law School, Hyderabad)*; Raneeta Pal (School of Law, Mahindra University, Hyderabad)

Law enforcement has undergone a significant shift with the adoption of artificial intelligence (AI) in the legal system. Integrating AI into the judiciary marks a crucial milestone in evolving legal practices globally. This paper examines AI's development in the legal system, tracing its historical milestones and adoption. It highlights how AI can revolutionize the judiciary by enhancing legal research, expediting procedures, and improving decision-making while addressing challenges like bias, transparency, job displacement, and the need for robust legal frameworks. Despite these challenges, AI

holds promise for reducing case backlogs, improving efficiency, and ensuring equal access to justice. The paper advocates for responsible AI integration, comprehensive legal frameworks, and collaboration between legal professionals and AI experts. It emphasizes the importance of balancing technological advancements with ethical considerations to create a fair and effective court system.

Climate Action 5.0: Mitigation and Adaptation

Basant Dumka (Uttaranchal Unversity)*

This study was aimed to discuss climate change aspects such as global warming and greenhouse gases, extreme weather events i.e. floods and droughts and sea level rise due to glacial melting with their mitigation techniques used during industrial revolution 1.0 to 4.0. Some recent technology and future possibilities to mitigate these aspects of climate change were discussed and recommended. The study concludes that the revolution of technology 5.0 that integrates AI/ML based models and IOT based sensors are powerful tools to estimate and simulate the climate change phenomena. Some recent technologies such as perovskite, bifacial solar panels and floating wind turbines are sources of renewable energy that do not cause global warming. Other technologies that convert useless ocean wave energy and geothermal energy into useful thermal and electric energy may be developed in upcoming recent years.

The design of a smart city-appropriate waste management and recycling system for solid waste

Prakash Kuppuswamy (SRM University)*; Shivangi Shrivastava (SRM University); Aaryan Gupta (SRM University); Siddharth Gaur (SRM University)

Effective waste management is crucial for the sustainability of the environment, where rapid urbanization has led to increasing waste generation and inadequate recycling practices. Traditional systems often fall short due to inefficiencies and lack of public engagement. This research introduces a user-friendly waste sorting gadget designed specifically for Indian urban contexts, which categorizes waste into recyclable, non-recyclable, and compostable materials. The gadget utilizes a machine learning-based system powered by a deep learning convolutional neural network (CNN). Users can place their waste items into the device, which scans and analyzes them using advanced image recognition technology. The design of the gadget emphasizes user-friendliness, featuring an intuitive interface with clear visual indicators. When waste is sorted, users receive immediate feedback on whether the item was categorized correctly.

An analysis of modern online applications with a focus on usability and security

Prakash Kuppuswamy (SRM University)*; Muskan Ostwal (SRM University); Mansi Garg (SRM University); Shirsaa Saha (SRM University)

Online applications are now at the centre of life, personal and professional, offering unprecedented convenience but indeed significant security and privacy challenges in this digital era. The constant integration of billions of devices into everyday interactions by IoT and 5G networks has expanded the scope of connectivity. I the paper try to explore online application security concerns and risks to privacy. Focus is made on the implications of having a 5G-enabled IoT infrastructure, promising much

in high-speed, reliable connectivity but highly susceptible to exploitation. This paper further analyses user interactions with built-in security features inside common applications and operating systems, showing the real reality of security tools: although they exist, it is not uncommon to find that they are hardly usable without jeopardizing end-users' effective defence mechanisms.

Facial Feeling Acknowledgment Utilizing CNN

Laxmi . (Indira Gandhi Delhi Technical University for Women)*

Facial Feeling Recognition could be a basic angle of human-computer interaction, empowering frameworks to translate and react to human feelings successfully. This analysis presents a strategy based on convolutional neural network (CNN) - for Facial Feeling Recognition utilizing grayscale facial pictures resized to 48x48 pixels. The Dataset of this research includes seven emotional categories of human behaviour: surprise, anger, disgust, fear, joy, sadness, and neutral. Various methodology of data augmentation is leveraged to improve the model's ability to generalize. The training procedure of this model is based on the Adam optimizer, a popular optimization algorithm. Investigation results show a significant shift in accuracy, which demonstrates the model's ability to use it for real life applications, for practical uses such intelligent robotics and mental health monitoring.

Pseudo-Hamiltonian Neural Networks with Mountain Gazelle Optimizer for Early Diagnosis of Pediatric Neurological Disorders Using Video Data

Sankara Reddy Thamma (Deloitte Consulting LLP)*; Bharath Reddy Devalampeta (DataEconomy Inc); Mukheswara Reddy Jangareddy (EXA Infrastructure); Dr.Rajiv Kumar (Uttaranchal Institute of Technology, Uttaranchal University)

Early Diagnosis of Pediatric Neurological Disorders Using Video Data refers to the use of video-based analysis and computational techniques to identify neurological conditions in children at an early stage. This approach uses deep learning, motion tracking, and clinical exams for early identification of developmental or behavioral issues that may require attention to have better treatment outcomes. The current methods of diagnosis always involve using subjective assessments hence giving room for delay, high errors, and variability in the method. To overcome these challenges, we propose the Pseudo-Hamiltonian Neural Networks with Mountain Gazelle Optimizer (Pseu-HnNNet+MGO) for the early detection of pediatric neurological disorders using video data. This approach utilizes the ASD Video Dataset as input, with initial preprocessing carried out using Guided Box Filtering (GBF) to enhance data quality. Key features are then extracted through the Multilayer Edge Attention Network.

Real Time IoT Enabled Detection of Safety Gear Non-Compliance Using YoloV8 and OpenCV

Akanksha Bankar (JSPM's Rajarshi Shahu College of Engineering)*; Abhiruchi Jagadale (JSPM's Rajarshi Shahu College of Engineering); Pooja Kundaragi (JSPM's Rajarshi Shahu College of Engineering); Pallavi Nath (JSPM's Rajarshi Shahu College of Engineering)

In industrial environments like power stations, ensuring compliance with safety protocols is vital for worker safety. This paper presents a novel approach to real-time detection of non-compliance with Personal Protective Equipment (PPE), specifically arc suits, using a combination of computer vision and IoT technologies with Arduino. Our method, integrating the You Only Look Once (YOLO) framework with Open CV and Arduino micro controllers, accurately identifies workers not wearing arcsuits, enhancing safety protocols. Performance evaluation demonstrates the effectiveness of our approach. We discuss implications for improving safety measures and minimizing hazards in industrial workplaces, along with avenues for future research.

AI for Pollution Control Using ML Models in Air and Water Quality Management and Innovative Approaches to Reduce Industrial Waste and Emissions

Sadhana Bhatt (Uttaranchal University)*

Since industries have grown all over the world pollution has remained a critical issue with much emphasis placed on minimizing air and water pollution. Challenges posed by today's evolving industrial pollution cannot be solved by conventional monitoring and regulation techniques, which present AI and ML as the potential breakthroughs. The following is a comprehensive work on the status quo of AI-based approaches for the monitoring and control of air and water pollutants with a keen focus on predictive models and artificial neural networks, deep reinforcement learning. Thus using these sophisticated methods, industries can predict leaching levels, decide the appropriate use of material resources, and alter emission management in real-time to greatly decrease waste and pollution. Moreover, we share cases, concerns, or how AI might help to achieve greener industry solutions.

Customer Segmentation Using Agglomerative Clustering

Attuluri Neha (Kalasalingam academy of research and education)*

Customer segmentation plays a crucial role in understanding consumer behavior, enabling businesses to tailor their strategies to meet specific needs and preferences. This paper explores the implementation of customer segmentation using Agglomerative Clustering, a hierarchical clustering method that groups data points based on their similarity in a bottom-up approach, forming a dendrogram to visualize the merging of clusters. By leveraging demographic and behavioral attributes such as gender, marital status, age, education level, profession, work experience, spending score, and family size, this study categorizes customers into distinct clusters, providing actionable insights for targeted marketing and personalized services.

Automating the Detection of Customer Sentiment using Machine Learning

Manisai Polisetty (Kalasalingam University)*

The goal of this project is to create a web application that employs natural language processing methods to conduct sentiment analysis. The program includes VADER Sentiment for text analysis and machine learning models, and it makes use of the Flask platform for web deployment. The system can recognize and classify emotions into positive, negative, and neutral attitudes by analyzing human input. The purpose of social media post analysis, review analysis, and other textual data analysis is to help businesses and people understand public opinion on a range of topics. By offering an intuitive user interface for visualizing sentiment scores and trends, the application facilitates improved decision-making based on input.This project's sentiment analysis web application integrates VADER Sentiment, a lexicon-based approach, to categorize text data into positive, negative, or neutral attitudes.

A Fundamental Concept & Systematic Reviews, understanding of the quantum search algorithms

Ashish Bhatt (Uttaranchal university)*; Sumit Chaudhary (Uttaranchal University); Rashmi Kuksal (Uttaranchal University); Varun Barthwal (HNB Garhwal university)

Quantum search algorithms, a revolutionary development in computing theory, use quantum physics to solve search problems faster than their classical counterparts. This systematic review thoroughly examines the development, advancement, and status of quantum search algorithms, with emphasis on their theoretical foundations, real-world applications, and performance in many computational contexts. In addition to new advances in quantum optimization and quantum-enhanced search approaches, we provide a comprehensive survey of important algorithms, including Grover's search algorithm. We also discuss hardware limitations, scalability issues, and difficulties with quantum error correction that hinder the widespread use of quantum search methods.

Predictive Maintenance and Implementation of Machine Learning in Manufacturing and Industrial 4.0 Applications.

Vivek John (Uttaranchal University)*

The Machine Learning (ML) integration in Industry 4.0 has significantly impacted the manufacturing industry. Industry 4.0 aims to enable smart factories that continuously collect and process production-related data using smart machinery, sensors, and gadgets. Additionally, algorithms using machine learning offer predictive insights, enabling the recognition of complex production trends and supporting smart systems for various manufacturing activities. Although different ML approaches have been implemented in production and manufacturing applications, many challenges remain, ranging from edge computing and cybersecurity issues in smart manufacturing to big data generation, retention, and real-time intelligent decision-making. This special issue aims to gather specialists to study ongoing experimental and theoretical research in the reinforcement of machine learning (ML) and its significance to manufacturing and production units.

Optimizing Brain Tumour Classification Models through Advanced Image Segmentation Techniques: A Review

Anshul Khemka (Lovely Professional University)*; Krishan Bansal (Lovely Professional Universityq)

By defining the problem in terms of time and accuracy, there will be a positive impact on the patient, and this medical imaging problem is still very much open in brain tumor classification. This research has an advanced image segmentation algorithm to present an optimized framework for the classification of brain tumors. The method brings depth-learning segmentation models like U-Net and Fully Convolutional Networks (FCNs) into more classical techniques like thresholding and region growing algorithms to increase the segmentation precision. As a preparation for the dataset of MRI scans that have T1, T2, and FLAIR images, they are preprocessed and enhanced toward better robustness with changing imaging conditions. The segmented tumor regions will be analyzed with feature extraction considering the texture, shape, and intensity features to capture tumor heterogeneity.

Security Challenges in Wearable Technologies

Alok sati (Uttaranchal university)*

Certain devices such as smartwatches, fitness trackers, or health monitors have rapidly evolved from being novelties into part of everyday life due to their advancements as wearable technologies. With real-time health monitoring, better communication, and better lifestyle management, these devices bring much to their users. Widespread adoption also brings serious security and privacy concerns. This discussion will consider the many threats of wearable technology in terms of sensitivity to data privacy and cybersecurity attacks, as well as attacks on device integrity, along with a few example areas of concern: unauthorized access to personal data; insecure communication protocols; and misuse of biometric biometric data. Such threats are expected to be found on the way to forming secure wearable devices with user trust and personal information security guaranteed.

A Multi-Layered Fuzzy-TOPSIS-AHP Framework for Blockchain Consensus Mechanism: Emphasizing Energy, Scalability, Security, and Performance

Mohit Arya (The ICFAI University Dehradun)*; Sanjeev Kumar (ICFAI University, Dehradun)

The consensus mechanism is the heart of blockchain technology. As blockchain evolves, there are several new consensus mechanisms that have been introduced. As of now, a total of 32 unique consensus mechanisms were found out through a systematic search on the Web of Science and Scopus databases. This research aims to find the best consensus mechanism on the basis of five different criteria: energy efficiency, security, scalability, complexity, and speed. Through Fuzzy TOPSIS, above 32 consensus mechanisms were evaluated on the selected criteria, and 5 consensus mechanisms were filtered out; further, the study employed the Fuzzy AHP MCDM technique to rank the 5 consensus mechanisms. The findings underscore the usefulness of Fuzzy-AHP in managing decision-making ambiguity and establishing a robust framework for evaluating and selecting optimal mechanisms.

The Role of Artificial Intelligence in Modern Warfare: A Transformative force

Prakash Kuppuswamy (SRM University)*; J. Jai Suriya (SRM University)

The United Nations (UN), formed in October 1945 as a successor to the League of Nations, has existed for over 75 years but has seen only five amendments to its charter. Artificial Intelligence (AI) is revolutionizing modern warfare, reshaping military strategies, and redefining global security. The integration of AI into military operations has introduced unprecedented capabilities, ranging from enhanced decision-making to autonomous systems that can operate in complex environments. While these advancements offer strategic advantages, they also pose ethical, operational, and geopolitical challenges. The UN Charter was last amended in 1965, twenty years after its formation, with no further amendments since then.

An artificial intelligence approach to the creation of custom surface plans

Prakash Kuppuswamy (SRM University)*; Rakshita R (SRM University); Amit Amit (SRM University); Vibhu khera (SRM University)

Floor plan optimization and prediction are crucial aspects of architectural planning and design. This study presents a machine learning-based approach to predict and suggest multiple floor plan layouts tailored to user-defined parameters, such as plot dimensions, the number of floors, and the number of bedrooms. Using a dataset containing 2D floor plan dimensions, we extract meaningful features such as plot area and room sizes through feature engineering and data pre-processing techniques. The proposed model employs Linear Regression to establish relationships between plot area, structural parameters, and room dimensions. To enhance usability, an interactive system is developed to generate customized floor plans. This system leverages user inputs to predict room sizes and applies variation techniques to suggest multiple realistic floor plan options. The results are presented in a standardized format with room dimensions for practical implementation.

Attendance using Face Detection – HAAR

Manav A (Karpagam Academy of Higher Education)*; Sanmathi T (Karpagam Academy of Higher Education); Sridhar P.T (Karpagam Academy of Higher Education); Sabarinath N (Karpagam Academy of Higher Education)

Automated attendance management systems are progressively being implemented in educational institutions and businesses to enhance efficiency and accuracy. Face detection technology provides a noninvasive and effective method for real-time attendance monitoring. This work presents a robust Attendance Management System employing real-time facial detection and the Haar Cascade classifier (HCC). The system automates attendance tracking, enhancing efficiency and minimizing manual intervention in educational or professional environments. The system utilizes computer vision techniques to capture live video feeds from a camera and employs the Haar Cascade approach for real-time human face detection. The suggested system offers a practical and effective solution for automating attendance management, enhancing transparency and efficiency. Future endeavors encompass the integration of edge computing to augment alongside the implementation measures to ensure such as GDPR.

AI-Driven Early Prediction of Post-COVID Health Complications Using Multi-Modal Data

Vineet Saini (Uttaranchal University Dehradun)*

It has been examined that a machine learning model needs a vast amount of clinical data. Moreover, each model needs to be tested with different data sets as well to give better performances, such that the government and stake-holders can plan better protocols to be deployed to fight and mitigate the effects of this dangerous virus. In this work, authors have proposed a Prediction model of Post-COVID Health Complications. Authors have used Decision tree algorithm on Multi-Modal Data. It has been applied to 7 selected features. The authors have trained and tested the model using Gini method as it has been best suited to our model.. The proposed model is tested on 70% data (128 samples) of available data (426 Samples) from various sources. We have calculated risk conditions using the decision tree (Gini impurity) algorithm. Our results show that 49.22% samples are under the risk ranges, Slight (30.47%), Mild (14.06%), and Severe (4.69%) of infection with 85.93% accuracy.

Lung Cancer Detection Using ANN Algorithm

Dhakshnamoorthy P (KAHE)*; Priyanka G (Karpagam Academy Of Higher Education); Gowtham A (Karpagam Academy Of Higher Education); Gunal K (Karpagam Academy Of Higher Education); Parthiban V (Karpagam Academy Of Higher Education)

This paper provides a unique strategy for the prompt detection and prognosis of lung cancer using Artificial Neural Networks (ANN). Cancer, one of the leading causes of morbidity and mortality worldwide, presents an urgent need for the development of diagnostic tools.This study aims to increase early detection skills by using advances in machine learning, notably ANN algorithms, which might lead to better patient outcomes. The proposed methodology trains the ANN using a large dataset of medical imaging data, with a particular emphasis on lung scans. The network is precisely constructed to learn about complicated patterns and traits associated with lung cancer, allowing for accurate predictions. The model's performance is assessed using known criteria such as sensitivity, specificity, and accuracy to determine its capacity to distinguish between malignant and non-cancerous lung pictures.

A Comprehensive Survey on EmpathVA: An AI-Enhanced Virtual Assistant for Victims of Digital Harassment

Pradnya Patil (JSPM Rajarshi Shahu College of Engineering)*; Sonali Rangdale (JSPM Rajarshi Shahu College of Engineering); Aditi Bele (JSPM Rajarshi Shahu College of Engineering); Vaishnavi Kundgir (JSPM Rajarshi Shahu College of Engineering); Janhavi Jadhav (JSPM Rajarshi Shahu College of Engineering)

Online harassment is a pervasive issue affecting mental well-being and online safety. This paper presents an AI-driven system to detect and mitigate harassment. Using a Flask-based web app, it integrates machine learning models and natural language processing (NLP) for real-time notifications. Key components include an XGBoost classifier and a deep learning model to identify and assess harassment severity. It categorizes them based on severity, while the system processes comments that have harmful content, including hate speech and bullying. The system sends real-time alerts and user-friendly interfaces with actionable steps like blocking or reporting.

AI-Enhanced Virtual Trial Room With Augmented Reality

Janalyn Maroula L (St. Joseph's Institute of Technology)*; Harini M (St. Joseph's Institute Of Technology); Mythili N (St. Joseph's Institute of Technology)

The Virtual Trial Room is an innovative augmented reality (AR) system that enables users to virtually try on apparel, enhancing the online shopping experience by simulating a physical fitting room. This technology leverages advanced computer vision, 3D modeling and machine learning to deliver an accurate and immersive experience. Data augmentation techniques are utilized to expand the training dataset, ensuring more precise clothing placement on different body types. The results demonstrate that our integrated approach, which combines AR and machine learning, significantly outperforms traditional virtual try-on systems, achieving enhanced user satisfaction, fit accuracy and personalized
recommendations. The convolutional neural network (CNN) used in the system accurately detects body and facial landmarks, allowing for real-time garment fitting and recommendations.

Optimizing Airline Ticket Pricing: A Predictive Approach to Identifying the Best Fares

C Bharath Kumar (Kalasalingam University)*

This project aims to develop a machine learning-based system for predicting flight prices using various input features such as departure and arrival dates, source and destination cities, number of stopovers, and
airline information. The volatility of airfares, influenced by factors like demand, seasonality, and competition, presents a challenge for both travelers seeking optimal ticket prices and airlines aiming to maximize revenue. To address this, the study utilizes advanced machine learning algorithms, including Random Forest (RF) and Gradient Boosting Machines (GBM), to analyze historical flight data and predict future prices with high accuracy. The models are trained on a comprehensive dataset containing multiple attributes of flights, with a focus on feature selection and preprocessing to ensure data quality. The performance of the models is evaluated through various metrics, including prediction accuracy effectiveness is compared

InterviewIQ AI-Powered Chatbot for Upskilling Candidates in Technical and HR Interviews

Ahamed R (Velammal College of Engineering and Technology)*; Vasanth P (Velammal College of Engineering and Technology)

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.

Feature Selection Techniques to recuperate high quality data using Bio inspired Algorithms

Dr Lalitha (MEASI Institute of Information Technology)*

A significant amount of the recent advancements in computerized reasoning (AI) have been fueled by machine learning, particularly deep learning (DL). Because DL relies on groups of related fundamental computing units operating in tandem, it relies on computational models that are, in part, bio-inspired. It is unclear whether hardware limitations will slow or stop the advancement of Moore's regulation and the ensuing anticipated subtle increases in processing power that can be achieved by scalingWhen the data set has more features, it will be easier to create an accurate feature relevant to the issue. The precision of the point will automatically decrease when the features raise the threshold values. The system becomes confused whenever data is introduced into the model. The simplicity of use of data with variables results in very efficient data with very high dimension, making a multitude of feature selection methods available in the process.

The role of artificial intelligence in data-driven retail decision making: A transformative approach

Prakash Kuppuswamy (SRM University)*; Avinash Kumar (SRM University)

This paper discusses the implementation of AI in the retail industry. It focuses on the process of identifying the importance and role of AI in retail businesses. It indicates major deficiencies in existing methodologies that are unable to accommodate the distinctive nature and complexity of a retailing environment. This research work recommends some existing FuzzylComplex to analysis a manufacturing-based methodology that brings a proper view of the problem and adaptability of the application. The research has conducted a bibliometric analysis of 404 articles published between 2000 to 2023. Besides the bibliometric analysis, it also includes keyword co-occurrence analysis. From this analysis, we get some emerging results, which include six major highlights of research, like consumer behaviour, AI in retail marketing, business performance, sustainability, supply chain management, and trust. The paper stresses how artificial intelligence transforms the operations of retail businesses.

AI For Climate Change Mitigation: Predicting And Responding To Global Warming

Pinky Uniyal (Uttaranchal University)*

Global warming is one of the pressing issues facing the world as it not only affects the social and natural environments but affects people’s lives. The increased number of catastrophes, the temperature increase, and disturbance of functioning of natural ecosystems require efficient and timely measures. Climate change has become another field where Artificial Intelligence (AI) has shown itself to be useful in increasingly intricate and capable forms through its abilities to improve predictive and analytical capacity, establish more efficient energy controls, and offer creative solutions to decrease the release of greenhouse gasses. An analysis of the application of AI in climate change is discussed in this paper specifically in light; of predictive modelling, optimisation of renewable energy resources, and intelligent monitoring of carbon emissions. In this paper, we review the AI approaches, including machine learning, deep learning, and reinforcement learning relevant

Renewable Energy Technologies: A review on assessing the Life Cycle Environmental Impact on biomass power plant

Ruby Pant (Uttaranchal University)*; Dr. Sanjeev Kumar Joshi (Uttaranchal University); Saurabh Aggarwal (Uttaranchal University)

Fuels were utilised to generate power in the past, and as a result, the gases released during combustion had an impact on the environment, the economy, society, and human health. After that, new methods are implemented in the environment to lessen or alleviate the effects caused by the burning of fuel. Electricity is now produced using renewable energy. The best technique for it is biomass. The most common cause of forest fires in the summer is pine needles. The local environment is harmed by these fires, which tend to undermine the soil's fertile top layer. Despite the fact that this pine needle fire is destroying the surrounding ecosystem. Therefore, the focus of this paper is on the review of life cycle assessment of the biomass power plant.

The Roadmap to Artificial Intelligence Business (AIB): Optimizing Tools and Techniques for Market Analysis and Business Strategy

Prakash Kuppuswamy (SRM University)*; Jai Suriya (SRM University); Bisman Singh (SRM University)

The rapidly changing of business landscape are increasingly using artificial intelligence business (AIB) techniques to access complex market dynamics and finding effective approaches. Using artificial intelligence (AI), businesses can modernise practises, improve decision-making, and eventually increase efficiency and value of the business. In addition to systemizing work, AIB can also provide valuable insights from a large data set. This article examines the applications of data mining, predictive analytics, natural language processing, machine learning, and neural networks as vital methods for analyzing markets and choosing the better business strategies. In this article, there are several optimization techniques and tools and impact of on business peformance that can be used by AIB were analysed. Moreover, we discussed the relationship between AIB and emerging digital technologies such as artificial intelligence, machine learning, and big data analytics.

Region-Specific Paddy Yield Forecasting: A Machine Learning Comparative Study in Uttarakhand

Malika Kulyal (SSJ campus almora)*

Rice is a cornerstone of food security, particularly in India, where it sustains both livelihoods and the economy. This research focuses on paddy yield prediction for the Udham Singh Nagar district in Uttarakhand by integrating climate, soil, and crop parameters using advanced machine learning techniques. Four classification models—XGBoost, Gradient Boosting, Random Forest, and Logistic Regression—were applied to analyze regional agricultural data.The study highlights Gradient Boosting as the most effective model, achieving an accuracy of 78.7% and an ROC-AUC score of 85.8%. XGBoost closely followed with 76.6% accuracy and an ROC-AUC score of 89.1% while Logistic Regression demonstrated moderate performance with 76.6% accuracy and an 83.3% ROC-AUC. Random Forest underperformed with a 68.1% accuracy and 78.5% ROC-AUC. This work provides a framework to integrate AI into agriculture, combining traditional practices with innovations to tackle global food security.

AI & ML-Based Autonomous Drone Systems For Advanced Security And Incident Management

Abhay Dhasmana (Uttaranchal University)*

The limitations of traditional surveillance systems in monitoring and responding to changing security threats in public spaces and critical infrastructure are becoming increasingly apparent. These systems are challenged by issues such as limited coverage, delayed detection of suspicious activities, and difficulty coordinating responses with law enforcement. As urban areas grow and environments become more complex, these limitations impede timely responses to security breaches. UAVs have become advanced in imaging, video capture, and surveillance, with numerous advantages over traditional systems. They can cover large areas rapidly, reach difficult-to-access locations, and provide real-time high-resolution video feeds. However, modern security demands an integrated surveillance system combining UAV technology with artificial intelligence, cloud computing, and advanced communication systems.

Aerospace And Industry 4.0 Integration: Exploring New Technology And Innovative Advances

Abhay Dhasmana (Uttaranchal University)*

Industry 4.0 is an enabling paradigm for modern industrial transformation that involves the integration of various digital technologies with physical processes of manufacturing to create smart, connected, and highly efficient production ecosystems. Industry 4.0 transformational impact and potential is examined within the aerospace industry, a sector characterized by its high complexity, high standards of quality, and critical role in global connectivity. The study covers all the foundational components of Industry 4.0 - IoT, AI, Robotics, Additive Manufacturing and Advanced Data Analytics- analysing their specific applications to key aerospace domains in Manufacturing, Operations, Maintenance and Supply Chain Management.

Optimized Railway Safety: Automated Railway Crossing Barriers

Abhay Dhasmana (Uttaranchal University)*

Level crossings continue to pose a substantial concern to drivers due to the inherent risk of colliding with trains. Human error, delayed answers, and inclement weather all enhance these hazards. This study describes an innovative automated railway crossing barrier system aimed to address these issues and improve overall safety. The technology uses ultrasonic technology to reliably identify oncoming trains inside a predetermined safety zone. When a train is detected, actuators are triggered, causing the crossing barriers to quickly fall, preventing road traffic from approaching the hazardous region. A visible display unit gives road users with real-time information regarding the train's closeness and the status of the barriers.

Deep Belief Network Enabled Dermatological Features Detection for Cancer Diagnosis

Stuti Bhatt (Uttaranchal University, Dehradun)*

Skin cancer may be a common sort of cancer, and its assurance and treatment can be moved forward through the integration of dermatological highlights into deep belief networks (DBNs). This term paper explores the potential of DBNs in revolutionizing the assurance and treatment of skin cancer by giving correct and strong analyze, moving forward treatment organizing, and lessening healthcare costs. DBNs offer some advantages, counting extended precision, efficiency, and openness, which can through and through overhaul the strategy of cancer conclusion. This approach encounters certain challenges, for event, the need for wide datasets and nonstop endorsement, the integration of dermatological highlights utilizing DBNs holds great ensure for the long-standing time of cancer assurance.

"Artificial Intelligence as a Catalyst for Equity and Social Justice"

Sneha sneha (Uttaranchal University)*

The technology known as artificial intelligence (AI) has the potential to greatly improve civilization in a number of areas. AI systems must, however, take into account the diversity of the communities they serve if this promise is to be fully realized. This study examines the crucial junction of diversity, equality, and inclusion (DEI) and artificial intelligence (AI), contending that a proactive and inclusive strategy is necessary to maximize AI's advantages while reducing its inherent risks. The study looks at how AI can be a potent instrument for furthering DEI programs by detecting and correcting biases in data and algorithms, encouraging inclusion in decision-making, and offering marginalized people individualized opportunities.
The paper concludes that while AI holds significant promise for advancing DEI goals, careful development and execution are crucial to guaranteeing fair results and preventing the reinforcement of prejudices.

OA-Net For Multi Stage Knee Osteoarthritis Classificaton Using An Extended Convolutional Neural Network Framework

Nethra M (St. Joseph's College of Engineering)*; Priyanka V (St. Joseph's College of Engineering); Tamizh Selvi A (St. Joseph's College of Engineering); Gopikha S (St. Joseph's College of Engineering)

Knee osteoarthritis (OA) is a prevalent degenerative joint disease affecting millions worldwide, necessitating early diagnosis and accurate staging for effective treatment. The study presents OA-Net, an advanced Convolutional Neural Network (CNN) framework designed for multi-stage classification of knee OA severity from X-ray images. OA-Net enhances conventional CNN architectures by capturing intricate spatial hierarchies, thereby reducing information loss. It employs sophisticated feature extraction and a specialized transition module for seamless feature flow across network stages. To address class imbalance, data augmentation techniques, including geometric transformations and contrast adjustments, are utilized. Evaluated on the OAI dataset, OA-Net achieved an accuracy of 92.8%, outperforming existing models and demonstrating significant improvements in sensitivity and F1 score.

Soil Type Classification and Analysis Using Convolutional Neural Networks

Shivani Sisodia (Uttaranchal University)*; Rajiv Kumar (Uttaranchal university)

Optimizing agricultural efficiency is need of the decade. Understanding soil and innovating methods to study soil using technology can help us save soil and environment. Conventional methods of soil testing are usually time and cost consuming. This study uses CNN and image processing to categorize soil into four categories: alluvial, clay, red and black soil. Three convolutional layers are followed by fully linked layers in the CNN architecture, which is intended to capture and understand intricate patterns of soil texture. The proposed model displayed soil classification results with an accuracy of 92%. Thus, CNN's can be effectively utilized in modern agricultural systems, providing an approach to automate managing and evaluating soil health.

Revolutionizing Brain Tumor Detection: Machine Learning-Powered Medical Imaging Analysis

Dr. Prithviraj Solanki (Parul Institute Of Engineering & Technology, Parul University)*; Bharath Reddy Devalampeta (DataEconomy); Vijaylakshmi Sajwan (Shivalik College of Engineering); Rajiv Kumar (Uttaranchal University)

Early detection of brain tumors is vital for improving survival rates, yet traditional diagnostic methods, such as manual analysis of MRI and CT scans, face limitations like low precision and reliance on human expertise. This research explores the application of machine learning (ML), specifically convolutional neural networks (CNNs) and deep learning algorithms, to automate and enhance medical image analysis. ML models trained on extensive datasets demonstrate superior accuracy and efficiency in detecting early-stage tumors, enabling faster diagnoses and personalized treatment strategies. This study highlights ML's transformative potential to revolutionize brain tumor detection, offering improved outcomes through AI-driven healthcare solutions.

AI-Driven Innovation Transforming Industries and Boosting Entrepreneurship

Pooja Verma (Uttaranchal University)*

AI plays a central role in the present development and future trends futuristic industries and entrepreneurship as an innovation enabler. This paper aims at discussing the impact of AI in changing some organizational sectors including the health, financial, manufacturing, and retail sectors through the application of automation models, decision support systems, and data analysis models . AI solutions are also helping in encouraging new businesses to enter a certain market by providing organizations and technologies that help new businesses grow faster, and provide the appropriate solutions which will help them in delivering an individualized experience. The study focuses on specific domains, which AI is having the most impact, presents use cases and reviews AI adoption problems. The paper ends with future trends where an optimum expectation of the future expansion of AI to revolutionize industries and build an innovation-based ecosystem and entrepreneurship.

Grid Modernization Strategies for Renewable Energy Integration

abhishek jain (Uttaranchal University)*; ARPIT JAIN (KL UNIVERSITY); Sachin Kumar (Uttaranchal University); Amit Jain (Roorkee Institute Of Technology)

Renewable energy sources have become more widely used, featuring both advantages and disadvantages for current power grids that require stronger flexibility compared to beforehand in order to operate well in the foreseeable future. In this study, we investigated the evolutionary methods of grid modernization to meet the demand for renewable energy with zero-carbon fuel technology. This study reviews technological advancements, such as smart grids, energy storage systems, and automated control mechanisms, that have led to the development of these plant-scale innovations, and a review is conducted on some policy frameworks driving them. Finally, case studies from different countries demonstrate how these strategies are applied in practice. Improvements to grid stability are significant, although barriers persist at both technical and regulatory levels.

Dynamic Weather Conditions and Air Quality Estimation for Health Risk Analysis Using a Gated Recurrent CNN Model

Dr Kayam Kumar (koneru lakshmaiah education foundation)*; Munugapati Bhavana (MLR Institute of Technology); Rayudu Prasanthi (Aditya Collage of Engineering and Technology); S. Suguna Mallika (CVR College of Engineering); Deepthi Kamidi (Vignan Institute of Technology and Science); Kapil Joshi (Uttaranchal University)

Air quality is closely influenced by weather, making meteorological data a valuable predictor for forecasting pollution. However, the complex interplay between weather and air pollutants presents challenges for accurate predictions. To address this, explainable deep learning techniques using Gated Recurrent CNN (GRU) architectures are applied, leveraging PM2.5 records and meteorological data (temperature, humidity, pressure). Shapley Additive Explanation (SHAP) evaluates model interpretability, revealing that meteorological data alone can maintain accuracy, while adding pollutants enhances performance. Key variables identified include temperature, humidity, and pressure. The proposed GRU model achieves 98.56% accuracy, 98.43% recall, and 97.93% precision, demonstrating significant improvements and real-time tracking potential.

Inception-V3 and Neural Network Ensemble for Accurate Pneumonia Detection in Medical Imaging

vijaylakshmi Sajwan (Shivalik College of Engineering)*; Himanshu Suyal (Bennett University); Prithviraj Singh Solanki (Shivalik College of Engineering); Rajiv Gill (Uttaranchal University); Sankara Reddy Thamma (Deloitte Consulting LLP)

Pneumonia is a significant health problem in the world, mainly affecting children and the elderly. Early diagnosis is key to proper treatment and minimizing mortality. This research presents a deep learning approach toward the automated identification of pneumonia via chest x-rays. The proposed approach employs a fully connected neural network for classification and utilizes InceptionV3 for collecting features. Utilizing a Kaggle dataset of 5,840 annotated radiographic photographs, divided into 80% for training and 20% for testing, the model attained an accuracy of 96.7%, with precision, recall, as well as F1-score of 96.7%, with an AUC of 0.994. The findings illustrate the model's efficacy in

differentiating between healthy lungs and those impaired by pneumonia. The system offers a cost-effective diagnostic solution, especially in resource-limited settings. Future work aims to enhance dataset diversity and model generalizability.

AI in Sustainable Agriculture Precision Farming for a Greener Future

Navjyoti Aggarwal (Uttaranchal Institute Of Technology)*

The world agricultural sector is under stress because of the on-going population increase, resource depletion and climate change. In return there is a call for sustainable agriculture that will feed the nation without compromising with ecology systems. Precision farming is one of the ways that using Artificial Intelligence (AI) can be used to address these challenges. AI ensures that resources are well utilized, wastage minimized and crops yields maximized through harnessing data analysis, machine learning to among others computer vision and Remote sensing technologies. To that end, this paper seeks to discuss the part that AI plays in reinventing agriculture and how precision farming practices can be used to support sustainability. Addressing various fundamental areas of AI implementation it defines smart irrigation systems, pest management, crop monitoring, and efficient soil utilization. The paper also seeks to establish the potential of the farming methods enhanced by AI,

Addressing AI Biases for Fair and Just Outcomes

Saurabh Chhillar (Uttaranchal Institute of technology)*

Artificial Intelligence (AI) has emerged as a transformative technology, but inherent biases in AI systems can lead to unjust outcomes, perpetuating discrimination and societal inequalities. This research paper examines the causes of AI biases, their societal impact, and strategies to address them, ensuring fairness and justice. Emphasizing diverse datasets, inclusive AI development, and ethical frameworks, the study proposes actionable solutions to mitigate biases and promote trustworthiness in AI systems.

Developing and promoting AI ethics guidelines

Shivansh Chauhan (Uttaranchal University)*

Artificial Intelligence (AI) is reshaping the world—revolutionizing industries, powering decision-making and enhancing productivity. But along with these benefits come risks: biased algorithms, privacy violations, and even the misuse of AI in warfare. These challenges underline the urgent need for robust AI ethics guidelines to ensure that AI development serves humanity responsibly. This paper explores what AI ethics entails, why guidelines are necessary, how they can be developed, and the challenges of implementing them globally.

AI for Social Good

Sohard Singh (Uttaranchal University)*

Artificial Intelligence (AI) has revolutionized numerous domains, demonstrating the potential to tackle complex challenges and improve societal well-being. This paper explores the transformative impact of AI for social good, examining its applications across diverse fields such as healthcare, education, environmental conservation, and disaster management. While highlighting its contributions, the paper

also addresses ethical concerns and challenges, proposing frameworks to maximize positive outcomes while mitigating risks.

Case Studies of AI Projects with Positive Social Impact

Sarvesh Singh (Uttaranchal University)*

Artificial Intelligence (AI) has been a driving force in transforming various sectors, such as healthcare, education, environment, and social services. While AI is often associated with technological advancement and business growth, it has also shown tremendous potential for contributing to social good. AI-based systems can improve lives, reduce inequalities, and solve critical global challenges. This research explores several AI projects that have had a significant positive social impact, highlighting how AI is being harnessed for humanitarian and societal betterment.

Case Studies of Ethical AI Implementations

Vimal Tatrari (Uttaranchal university)*

Artificial Intelligence (AI) is transforming industries globally, from healthcare to finance and beyond. However, the rapid development of AI technologies has raised significant concerns regarding ethics, transparency, bias, and accountability. This paper examines case studies where AI has been implemented ethically, focusing on transparent, responsible, and equitable outcomes. Through exploring various sectors, this paper identifies best practices in ethical AI implementation and provides insights into overcoming the challenges associated with AI's widespread use.

Data Privacy and Security: Principles, Challenges, and Solutions

Divyam Bora (Uttaranchal University)*

In today’s digital age, data has become a valuable asset, driving innovation, business models, and societal advancements. However, the rapid expansion of data generation and usage has given rise to significant concerns about privacy and security. Data privacy and security are critical components of protecting individuals' rights and maintaining the integrity of systems in a world where personal and sensitive data is continuously collected, stored, and analyzed. This paper explores the principles and challenges surrounding data privacy and security, examines current laws and regulations, and analyzes emerging technologies aimed at enhancing data protection. By addressing the evolving threats and discussing best practices, the paper aims to provide a comprehensive overview of data privacy and security, highlighting the balance between innovations and safeguarding personal information.

AI Transparency and Explainability: A Research Paper

Shubham Mehra (uttaranchal university)*

As Artificial Intelligence (AI) systems continue to integrate into various facets of society, the importance of transparency and explainability in these systems has become increasingly crucial. Transparency and explainability aim to address the "black box" nature of many AI models, especially deep learning algorithms, which, despite their high performance, are often difficult to interpret and understand. This paper explores the concepts of AI transparency and explainability, investigates the challenges associated with these goals, and reviews current research and techniques designed to

enhance AI's interpretability. Additionally, it discusses the ethical implications of opaque AI systems, particularly in critical areas such as healthcare, finance, and law. The paper concludes with a call for further research into developing more robust, transparent, and explainable AI systems, advocating for a collaborative approach involving stakeholders from academia, industry, and government.

AI Governance and Policy: Shaping the Future of Artificial Intelligence

shivam dhiman (uttaranchal university)*

As Artificial Intelligence (AI) rapidly transforms industries and societies, the importance of establishing a robust governance and policy framework becomes paramount. AI technologies promise significant benefits in healthcare, education, transportation, and other sectors, but they also pose risks related to privacy, ethics, security, and economic inequality. This paper explores the current state of AI governance and policy, analyzing the challenges faced by governments, institutions, and industries in regulating AI systems. It discusses key areas such as ethical guidelines, transparency, accountability, international cooperation, and the role of public and private sectors in shaping AI governance. Furthermore, it highlights emerging models of AI regulation and suggests potential pathways for developing effective AI policies to balance innovation with societal well-being.

Developing and Promoting AI Ethics Guidelines

Kartikeya . (UTTARANCHAL UNIVERSITY)*

The rapid advancement of artificial intelligence (AI) has brought about transformative benefits across various domains, but it has also introduced significant ethical challenges. Developing and promoting AI ethics guidelines is crucial to ensure responsible AI development and deployment. This paper explores the key principles underpinning AI ethics, including fairness, transparency, accountability, privacy, and human-centricity. It examines the process of crafting comprehensive guidelines that address diverse stakeholder concerns and accommodate cultural and regulatory differences across regions. The paper also highlights strategies for promoting the adoption and implementation of these guidelines, such as collaboration between policymakers, industry leaders, and academia, as well as public engagement and education. Case studies of existing frameworks are analyzed to identify best practices and areas for improvement.

Techniques for ensuring data privacy in AI applications

Souhrik Talukder (Uttaranchal University)*

As artificial intelligence (AI) applications increasingly rely on vast amounts of data, ensuring data privacy has become a critical challenge. This paper examines various techniques designed to protect sensitive information while maintaining the functionality and accuracy of AI systems. It explores a range of approaches, including data anonymization, differential privacy, federated learning, homomorphic encryption, and secure multi-party computation. The paper evaluates the effectiveness, scalability, and limitations of these techniques in diverse application contexts such as healthcare, finance, and social media. Additionally, it discusses emerging trends and regulatory frameworks that influence privacy-preserving AI practices. By analyzing real-world case studies and experimental findings, this paper provides actionable insights and recommendations for researchers, developers, and

policymakers to design AI systems that uphold data privacy without compromising performance.

AI Governance and Policy: Shaping the Future of Artificial Intelligence

Shivam Rajput (Uttaranchal University)*

The rapid advancement of artificial intelligence (AI) presents transformative opportunities across industries and societies, while also introducing complex ethical, legal, and societal challenges. Effective AI governance and policy frameworks are critical to ensuring that AI development and deployment align with societal values, promote equitable outcomes, and minimize risks. This paper explores the multifaceted dimensions of AI governance, including ethical considerations, regulatory approaches, and international collaboration. It examines key issues such as algorithmic accountability, bias mitigation, data privacy, and the socio-economic impacts of automation. Furthermore, the paper highlights the need for dynamic, inclusive, and adaptive. By addressing these challenges through robust governance mechanisms, policymakers and stakeholders can shape a future where AI contributes to sustainable
development, human rights, and global well-being.

AI in Cyber security: Enhancing Threat Detection and Prevention

Shivam Singh (Uttaranchal University)*

This report explores the transformative role of Artificial Intelligence (AI) in cyber security, focusing on its applications, benefits, challenges, and future potential. AI enhances threat detection through anomaly and behavioral analysis, facilitates rapid incident response, predicts vulnerabilities, and combats fraud. While offering scalability, speed, and precision, AI adoption faces challenges such as data quality, adversarial use, integration complexities, and high costs. The report concludes with insights into emerging trends, including autonomous security systems, federated learning, and addressing quantum computing threats, highlighting AI's growing importance in safeguarding digital ecosystems

Article Template for Addressing AI Biases and Ensuring Fairness

Prateek Singhal (Uttaranchal University)*

Most of our lives can be altered by artificial intelligence, but its benefits can be turned upside down by biases and unfavorable outcomes. Biases in AI can further exacerbate the existing societal inequalities, harm the reputation of businesses, and have far-reaching consequences. The types and causes of AI biases, their impact, and countermeasures are discussed in the paper that follows. It emphasizes training data diversity, frequent testing for bias, human supervision, and algorithmic fairness for the fair use of AI systems. With an understanding of the reasons and mechanisms behind AI biases and through the implementation of best practices, businesses can build and use AI that is fair, equitable, and beneficial to society. This article is very informative in summarizing the handling of
AI biases, guaranteeing equity, and building a more just AI environment-acts as a manual for all stakeholders, legislators, and developers.

Job Creation and Workforce Development: A Comprehensive Analysis of Current Trends and Future Strategies

Shriyanshi Dangwal (Uttaranchal University)*

This research paper examines the intricate relationship between job creation initiatives and workforce development programs in the modern economy. The study analyzes the effectiveness of various workforce development strategies and their impact on sustainable employment generation across different sectors. Through comprehensive data analysis and case studies spanning multiple regions, we investigate the correlation between skills training programs, educational initiatives, and successful job placement rates. Our findings indicate that integrated approaches combining targeted skills development, industry partnerships, and technological adaptation yield the most successful outcomes in job creation and workforce sustainability. The research also highlights the critical role of public-private partnerships in bridging the skills gap and creating sustainable employment opportunities.

Applications of Artificial Intelligence in Industry and Manufacturing

Shivam Kumar (Uttaranchal University)*

The integration of Artificial Intelligence (AI) in industry and manufacturing revolutionizes production processes by enhancing efficiency, precision, and adaptability. AI technologies such as predictive maintenance, quality control, supply chain optimization, generative design, human-robot collaboration, and real-time monitoring transform traditional manufacturing systems. This paper explores these applications, highlighting the impact of AI on the industry.

Review on the strategy of Online Code Compiler

Abhishek Jain (Uttaranchal University)*; Sachin Kumar (Uttaranchal University); Amit Jain (RIT,Roorkee)

The compiler is essential to the operation of programs. It transfers written source code in text format into an executable format called object code. A compiler that is designed to run manually on every system will take up a lot of disk space and, if it is not installed with default settings, will need to be properly configured. The majority of apps and the interfaces that go with them are designed to function online in today's society. Thus, we have developed an online compiler. Its primary goal is to enable users to compile and execute programs written in any language without the need to download an IDE (Integrated Development Environment) or compiler. On the client machine, no development kit is required. The purpose of this study is to describe an online compiler that supports platform independence. Using cloud computing reduces the issue of mobility and storage capacity. Programmers may easily compile and eliminate all defects by using many compiler types at a single interface.

Composite Fractals for Enhanced Cryptosystem Security

Deepak Negi (Amrapali University (AU))*

Abstract. The behavior of the logistic map has already been studied using one-step, two-step, three-step, and four-step iterative processes and it has been proved that for higher values the logistic map converges. When two polynomial functions are combined with each other it creates a composite set.

The Mandelbrot set, a well-known fractal function, is combined with the Noor function it form Noor Composite Mandelbrot Sets (NCMs). This method can also be used to generate new types of fractals structures. In this paper, we study the characteristics of composite fractals and apply them to a novel method for a unique cryptosystem. In the domains of real and complex numbers, the iteration of composite functions can give fast result for chaotic behavior of fractals.

AI Transparency and Explainability

Sujal Maity (Uttranchal University)*

AI transparency and explainability are vital components in ensuring trust and accountability in artificial intelligence systems. This study explores the methodologies and tools for making AI systems transparent, interpretable, and trustworthy. It also highlights the challenges in achieving explainability and provides case studies where explainable AI has significantly impacted real-world applications. By addressing the importance of transparency, this paper aims to advance the adoption of ethical AI practices.

Keywords: AI transparency, explainable AI, ethical AI, trust in AI, interpretability

AI for social good

Sumit Singh (Uttaranchal University)*

Artificial Intelligence (AI) refers to the simulation of human intelligence processes by machines, particularly computer systems. These processes include learning (the acquisition of information and rules for using it), reasoning (using rules to reach approximate or definite conclusions), and self-correction. AI technologies encompass a wide range of applications, from natural language processing and computer vision to robotics and expert systems

Article Template for Addressing AI Biases and Ensuring Fairness

Mahidhar Chittoor (Uttaranchal university)*

Most of our lives can be altered by artificial intelligence, but its benefits can be turned upside down by biases and unfavorable outcomes. Biases in AI can further exacerbate the existing societal inequalities, harm the reputation of businesses, and have far-reaching consequences. The types and causes of AI biases, their impact, and countermeasures are discussed in the paper that follows. It emphasizes training data diversity, frequent testing for bias, human supervision, and algorithmic fairness for the fair use of AI systems. With an understanding of the reasons and mechanisms behind AI biases and through the implementation of best practices, businesses can build and use AI that is fair, equitable, and beneficial to society. This article is very informative in summarizing the handling of AI biases, guaranteeing equity, and building a more just AI environment-acts as a manual for all stakeholders, legislators, and developers.

Artificial Intelligence for Environmental Sustainability

Sneh Agrawal (Uttaranchal University)*

Artificial Intelligence (AI) has emerged as a transformative technology, with vast potential to address global challenges, particularly in the field of environmental sustainability. This paper explores the various applications of AI in environmental conservation, energy efficiency, waste management, and

climate change mitigation. By integrating AI technologies with sustainable practices, we can optimize resource management, reduce carbon emissions, and enhance the resilience of ecosystems. The paper examines AI's role in environmental monitoring, predictive analytics, smart cities, and renewable energy integration. Furthermore, it discusses the ethical considerations, challenges, and future prospects of using AI for sustainable development

Innovation and Entrepreneurship

Shubham Rana (Uttaranchal University)*

AI empowers entrepreneurs by providing tools for efficient market analysis, product development, and idea generation. AI-driven startups are increasingly disrupting industries like healthcare, finance, and e-commerce by introducing innovative solutions

Ethical AI: Data privacy, security, governance

Pasupuleti Teja (Uttrakhand University)*

The rapid advancements in Artificial Intelligence (AI) have brought transformative opportunities but also significant ethical challenges, particularly in the realms of data privacy, security, and governance. This article explores the critical role of ethical AI in safeguarding individual rights and fostering trust in AI-driven systems. It examines the intersection of AI ethics, data protection regulations, cybersecurity protocols, and governance frameworks, highlighting how they converge to ensure responsible AI development and deployment. By addressing the implications of bias, accountability, and transparency, this article provides actionable insights for organizations aiming to build ethical AI systems that align with societal values and legal obligations.

Ethics in AI practices

Suhani Sagar (Uttaranchal University)*

Artificial Intelligence (AI) has become a transformative force across industries and society, offering immense potential for innovation, efficiency, and problem-solving. However, its rapid development and deployment raise significant ethical concerns, making it imperative to address issues such as fairness, accountability, transparency, privacy, and the broader societal implications of AI systems. This paper delves into the ethical principles guiding AI practices and explores strategies for fostering responsible innovation.

Climate Change Mitigation and Adaptation

Shreshth Shukla (Uttaranchal University)*

Climate change presents a critical challenge, threatening ecosystems, economies, and human well-being. Addressing this crisis requires a dual approach of mitigation and adaptation. Mitigation focuses on reducing greenhouse gas emissions through renewable energy, energy efficiency, and sustainable practices, aiming to limit global warming. Adaptation enhances resilience to unavoidable impacts, such as rising sea levels, extreme weather, and biodiversity shifts. This paper explores the synergy between these strategies, drawing on examples from urban planning, agriculture, and technology. It underscores

the importance of integrated efforts, robust policy frameworks, global collaboration, and community engagement. By balancing mitigation and adaptation, societies can confront the root causes and consequences of climate change, paving the way for a sustainable and resilient future.

Climate Change Mitigation and Adaptation

Shubham Joshi (Uttaranchal University)*

The growing threat of climate change demands an urgent and balanced approach to safeguard ecosystems, economies, and communities. This research explores the twin strategies of mitigation and adaptation. Mitigation addresses the root causes by reducing greenhouse gas emissions through renewable energy adoption, improved energy efficiency, and sustainable practices. Adaptation focuses on minimizing climate impacts by enhancing resilience against rising sea levels, extreme weather, and ecological disruptions. By examining successful case studies across sectors such as urban planning, agriculture, and technology, this paper highlights the interdependence of these strategies. It emphasizes the role of global cooperation, policy innovation, and community participation in building a sustainable future. Together, mitigation and adaptation offer a comprehensive path to manage and reduce the risks posed by the climate crisis

Automated Classification of Anemia Types Associated with Bacterial Infections Using CBC Parameters and Stacking Models

Jasdeep Singh (RIMT University Mandi-Gobindgarh); Jasmeen Gill (RIMT University Mandi-Gobindgarh); Yogesh Kumar (Pandit Deendayal Energy University)*

Bacterial infections, including anemia caused by bacterial pathogens, pose significant health challenges globally. Accurate classification of anemia types is critical for effective management and treatment. In the present work, we consider the classification of anemia type based on the CBC data and propose the usage of the ML methods. After the comparison of eight different models, the three top-performing models are therefore Random Forest, Gradient Boosting, as well as the Stacking Classifier models. Random Forest and Gradient Boosting models yielded nearly similar accuracy of 99% while Stacking Classifier showed tremendous result with an accuracy of 98%, precision of 99% and F1 score of 98%. In class-wise analysis, it was confirmed that the training model gave perfect classification of both “Normocytic hypochromic anemia” and “Normocytic normochromic anemia” even though the real problem lays in the under-represented and diverse class such as Leukemia with thrombocytopenia.

Innovation and Entrepreneurship

Shubham Negi (Uttaranchal University)*

Innovation and entrepreneurship are critical drivers of economic growth and societal advancement. This paper explores their interconnected roles, focusing on how innovation fuels entrepreneurial ventures. It examines how entrepreneurs identify market opportunities, create value, and disrupt existing industries through novel products and services. The study emphasizes the importance of creativity, risk-taking, and adaptability in achieving entrepreneurial success, and highlights the role of supportive ecosystems, including access to capital, mentorship, and favorable regulations. Case studies from diverse industries demonstrate how innovation leads to the emergence of new markets and technologies. Ultimately, fostering innovation within entrepreneurial frameworks contributes to

increased competition, job creation, and technological progress, benefiting both individuals and economies in the long term.

Machine learning for travel recommendations and planning

Sarthak Negi (Uttranchal university)*

The travel industry has transformed with the integration of machine learning, enabling personalized and efficient solutions for planning and recommendations. This study examines how machine learning algorithms analyze user preferences, historical data, and contextual factors to tailor travel experiences. Techniques such as collaborative filtering, content-based filtering, and natural language processing help suggest destinations, accommodations, and itineraries. Predictive models support cost estimation, travel timing, and trend forecasting, improving decision-making for travelers. Machine learning allows the travel industry to offer smarter and more adaptive planning solutions.

AI governance and policy

Shivam Kumar (Uttaranchal University)*

The rapid growth of artificial intelligence (AI) demands robust governance frameworks and policies to manage its societal impact. This paper highlights key principles, challenges, and recommendations for AI governance, aiming to establish global standards that promote ethical, transparent, and equitable AI systems.

Artificial intelligence in cyber security

Arempula Rohith (Cyber security)*

This paper explores the application of artificial intelligence (AI) in cybersecurity to enhance threat detection and response capabilities. It examines how AI algorithms and techniques, such as machine learning and deep learning, can be leveraged to analyze large volumes of data, identify patterns, and detect anomalies indicative of cyber threats. The paper also discusses the challenges and ethical considerations associated with AI in cybersecurity and highlight the potential benefits of integrating AI technologies into existing frameworks

Application of Artificial intelligence in Industry and Manufacturing

Shivam kumar (Uttaranchal University)*

The integration of Artificial Intelligence (AI) in industry and manufacturing revolutionizes production processes by enhancing efficiency, precision, and adaptability. AI technologies such as predictive maintenance, quality control, supply chain optimization, generative design, human-robot collaboration, and real-time monitoring transform traditional manufacturing systems. This paper explores these applications, highlighting the impact of AI on the industry.

AI for Tourism and Hospitality

Sunep Tiba (Uttaranchal University)*

Northeast India, with its breathtaking landscapes, diverse cultures, and unique history, is emerging as an increasingly popular tourist destination. However, despite its immense potential, the region faces several challenges, including limited infrastructure, a lack of advanced technology, and the need for sustainable tourism solutions. Artificial Intelligence (AI) can play a transformative role in overcoming these challenges, optimizing services, enhancing the tourist experience, and ensuring the long-term sustainability of the industry.

Application of Artificial intelligence in Industry and Manufacturing

Shippu Kumar (Uttaranchal University)*

The integration of Artificial Intelligence (AI) in industry and manufacturing revolutionizes production processes by enhancing efficiency, precision, and adaptability. AI technologies such as predictive maintenance, quality control, supply chain optimization, generative design, human-robot collaboration, and real-time monitoring transform traditional manufacturing systems. This paper explores these applications, highlighting the impact of AI on the industry.

Techniques for Ensuring Data Privacy in AI Applications

Shivansh Mourya (Uttaranchal University)*

Artificial Intelligence (AI) has revolutionized multiple industries, from healthcare to finance, offering innovative solutions and insights. However, the vast data required to train and deploy AI models raises significant privacy concerns. Ensuring data privacy is paramount to maintain user trust, comply with regulations, and foster ethical AI practices. This paper explores various techniques to protect data privacy in AI applications, including differential privacy, federated learning, homomorphic encryption, secure multiparty computation, and synthetic data generation. We discuss the strengths and limitations of each method and suggest strategies for their implementation in diverse AI systems.

Agriculture innovation

Shubham Kumar (Uttaranchal University)*

Today, amidst rapid technological advancements, it is undergoing a profound transformation. With the global population expected to increase significantly, the need for about 70% more food by mid-century poses a substantial challenge, especially under the current constraints of resource scarcity and changing climate conditions. Artificial Intelligence offers unprecedented opportunities for agriculture. AI's impact is far-reaching. Whether it's analyzing land use with high-precision satellite imagery or predicting crop diseases through real-time monitoring, AI applications are gradually taking root globally. As AI deepens its roots in agriculture, we are witnessing the dawn of a smarter, more efficient, and sustainable era of farming. how they are revolutionizing traditional agricultural practices:-

Crop Disease Detection,Automated Weed Control Systems,Predictive Analysis for Crop Yield,Precise Irrigation System,Drone-Assisted Aerial Surveillance,Supply Chain and Demand Forecasting

Article Templete For Sustainable AI Development

Anuj Kumar (Uttaranchal Unniveraity)*

The rapid advancement of artificial intelligence (AI) has brought transformative changes across industries, but it has also raised concerns about sustainability in terms of environmental, social, and economic impacts. This paper explores the concept of Sustainable AI Development, focusing on designing and deploying AI systems that minimize environmental footprints, promote inclusivity, and support long-term societal benefits. We delve into energy-efficient AI models, ethical frameworks for AI governance, and strategies for reducing bias and enhancing accessibility. Furthermore, we address the lifecycle of AI systems, from data collection and algorithm training to deployment and disposal, emphasizing the importance of transparency and accountability. By integrating principles of sustainability into AI development, we aim to chart a path toward technologies that not only solve current challenges but also ensure a sustainable future for humanity and the planet.

Ethical AI Practices

Shreyanshu Rai (Uttaranchal University)*

As Artificial Intelligence (AI) becomes a cornerstone of technological innovation, its ethical use is paramount to ensure societal trust, equity, and well-being. Ethical AI practices are frameworks, guidelines, and methodologies aimed at aligning AI development and deployment with human-centric values. This paper explores key principles of ethical AI, including fairness, transparency, accountability, privacy, and inclusivity. It also highlights challenges in achieving ethical AI and suggests actionable steps to ensure its widespread adoption.

Leveraging AI for Humanitarian Efforts and Social Causes

Shubham Singh (Uttaranchal University)*

Artificial Intelligence (AI) has shown significant potential in transforming humanitarian and social efforts by addressing critical global challenges. This paper investigates how AI technologies, including machine learning, natural language processing, and predictive analytics, can be applied to areas such as disaster response, healthcare, poverty alleviation, and human rights advocacy. AI can optimize resource allocation, improve decision-making, and facilitate access to essential services for underserved communities. However, ethical concerns such as algorithmic biases and data privacy need to be addressed to ensure equitable AI implementation. This study highlights key challenges, proposes solutions, and emphasizes the importance of cross-sector collaboration to responsibly harness AI for social good.

Ethical AI Practices

Sheel Ashish Shah (Uttaranchal University)*

The rapid development of Artificial Intelligence (AI) has revolutionized industries and societies, introducing both opportunities and ethical challenges. This research explores the ethical considerations essential for developing and deploying AI systems responsibly. Using a qualitative research method, we analyze case studies of AI applications in critical domains like healthcare, finance, and autonomous vehicles. The study highlights key ethical principles, such as fairness, accountability, transparency, and privacy, and discusses frameworks to mitigate potential risks. The findings underscore the need for robust ethical guidelines to balance innovation with societal values, ensuring AI benefits all stakeholders.

Data Privacy and Security

Sundram Kumar (Uttaranchal University)*

In an increasingly digital world, data privacy and security are paramount concerns for individuals, organizations, and governments alike. The proliferation of digital technologies has led to a surge in data generation, necessitating robust strategies for its protection. This paper explores the evolving landscape of data privacy and security, examining the key concepts, challenges, and solutions that shape this critical field. It provides an overview of data privacy principles, security frameworks, current threats to data integrity, and emerging technologies designed to mitigate risks. The paper also discusses the legal and ethical considerations surrounding data privacy, offering a comprehensive approach to understanding the complexities of securing sensitive information in the modern era.

Ethical AI Practices

Sourabh Singh (Uttaranchal University)*

Artificial Intelligence (AI) is transforming industries, economies, and societies in profound ways. However, the deployment of AI technologies raises significant ethical concerns, including bias, discrimination, accountability, transparency, and privacy. This paper explores the ethical challenges associated with AI systems and outlines best practices for ensuring AI deployment aligns with ethical principles. It examines issues related to fairness in AI algorithms, the need for accountability in AI decision-making, the importance of transparency in AI models, and the role of regulation in guiding ethical AI development. By exploring current efforts, frameworks, and policies, this paper offers a comprehensive understanding of how AI systems can be developed and used responsibly.

Ai Governance And Policy

Polisetti Venkata Sai Deepak (Uttaranchal University)*

the advent of Artificial Intelligence (AI) presents transformative opportunities across various sectors while raising critical governance and policy challenges. This paper explores the intersection of AI governance frameworks and sustainable development, emphasizing ethical considerations, accountability mechanisms, and policy interventions necessary to regulate AI systems. By examining current global AI governance practices, this study identifies gaps and proposes actionable recommendations to align AI innovations with the United Nations' Sustainable Development Goals (SDGs). Key themes include addressing biases in AI algorithms, ensuring transparency, and fostering international cooperation to create inclusive AI policies. The findings aim to contribute to the development of robust governance structures that promote responsible AI deployment for societal benefit.

Analysis of Pressure Drop and Forced Convective Heat Transfer in Nanofluids during Turbulent Flow with Al 2 O 3 and CuO

Kshitij Pandey (Uttaranchal University)*

This research presents the effect of Al 2 O 3 and CuO nanoparticles on convective heat transfer characteristics, especially pressure drop, under turbulent flow conditions. Investigation was done by conducting experiments to compare performances between nanofluids and their base fluid. The result of this study is such that with an increase in nanofluid concentration, heat transfer coefficient significantly enhanced. This enhancement is mainly due to the combined effect of enhanced thermal conductivity and turbulence that nanomaterials introduce in the base fluid. Notable in this respect is that this enhancement in heat transfer comes at the cost of a corresponding increase in pressure drop.

Article Template for Addressing AI Biases and Ensuring Fairness
Mohammed Farhan (Uttaranchal University)*

Most of our lives can be altered by artificial intelligence, but its benefits can be turned upside down by biases and unfavorable outcomes. Biases in AI can further exacerbate the existing societal inequalities, harm the reputation of businesses, and have far-reaching consequences. The types and causes of AI biases, their impact, and countermeasures are discussed in the paper that follows. It emphasizes training data diversity, frequent testing for bias, human supervision, and algorithmic fairness for the fair use of AI systems. With an understanding of the reasons and mechanisms behind AI biases and through the implementation of best practices, businesses can build and use AI that is fair, equitable, and beneficial to society. This article is very informative in summarizing the handling of AI biases, guaranteeing equity, and building a more just AI environment-acts as a manual for all stakeholders, legislators, and developers.

Article Template for Addressing AI Biases and Ensuring Fairness
Jeewan Singh (Uttaranchal University)*

Most of our lives can be altered by artificial intelligence, but its benefits can be turned upside down by biases and unfavorable outcomes. Biases in AI can further exacerbate the existing societal inequalities, harm the reputation of businesses, and have far-reaching consequences. The types and causes of AI biases, their impact, and countermeasures are discussed in the paper that follows. It emphasizes training data diversity, frequent testing for bias, human supervision, and algorithmic fairness for the fair use of AI systems. With an understanding of the reasons and mechanisms behind AI biases and through the implementation of best practices, businesses can build and use AI that is fair, equitable, and beneficial to society. This article is very informative in summarizing the handling of AI biases, guaranteeing equity, and building a more just AI environment-acts as a manual for all stakeholders, legislators, and developers.

Advanced Threat Management and Mitigation
Ramakrishna Sakinala (Uttaranchal university)*

Advanced Threat Management and Mitigation In the rapidly evolving digital landscape, organizations face increasingly sophisticated cyber threats. Advanced Threat Management and Mitigation focuses on proactive strategies to enhance the detection, analysis, and response to potential security breaches. This approach leverages cutting-edge technologies such as Artificial Intelligence (AI), Machine Learning (ML), and automation tools to identify anomalies and address vulnerabilities in real time. This paper

discusses the significance of adopting a holistic approach to cyber defense, emphasizing the role of collaboration, technology, and automation in building resilient security frameworks. Advanced Threat Management and Mitigation is essential for organizations aiming to safeguard sensitive data and maintain operational integrity in an increasingly hostile cyber environment.

Unlocking Global Knowledge: Innovations in Seamless Multilingual Information Retrieval

Arpit Goel (Uttaranchal University); Arpit Goel (Tula's Institute)*

In our increasingly connected world, accessing and aggregating information across geographies is a challenge. This article takes a deeper look at the technologies and innovations that contribute to the availability of valuable information in multiple languages. It examines the complexities of multilingual data processing and explores innovative approaches to bridging language gaps for globally accessible databases. This work covers natural language processing and multilingual data retrieval through advances in multilingual annotation, query extension, and machine translation, and the role of communication and language representation in the data retrieval process in the effort. The critical research and fact check presented here highlight the progress, capabilities, and challenges of developing multilingual data retrieval systems for global use.

Mapping the global landscape of AI in Dyslexia diagnosis: Bibliometric analysis insights and a framework proposal aligned with UN-SDG

Harshal Gunwant (The ICFAI University)*; Dr. Sanjeev Kumar (ICFAI Tech School, The ICFAI University, Dehradun); Dr. Nishant Mathur (ICFAI Tech School, The ICFAI University, Dehradun); Dr. Rajiv Kumar (Computer science and engineering department, Uttaranchal institute of technology, Uttaranchal University, Dehradun)

Dyslexia is a neurodevelopmental disorder that affects reading and the processing of language. Traditional diagnosis is time-consuming and does not cater to varying demographics and languages, this research aims to propose a transformative AI-based framework leveraging diverse modalities of handwriting, eye-tracking, electroencephalography (EEG), and speech with a longitudinal approach. Using machine learning models like CNN, RNN, and Transformer architectures, the framework promises to seize existing deficits, such as dataset heterogeneity, feature selection, class imbalance, and applications in real life. The use of explainable AI in this initiative provides ethical and transparent diagnostics based on a globally representative dataset. This work is also aligned with the UN SDG 3, 4, 10, and 17. It aims to achieve accuracy in diagnostics, better cultural adaptation, and standards of machine learning technologies in both health and education.

Sustainable AI Development

Deepika kumari (Amrapali University (AU))*

To provide standard surrounding and environmental conditions for living in urban cities the smart city concept is being evolved. However to implement the concept of smart city is a challenging task with several issues. This chapter introduces various studies in perspective to smart cities. Initially the

history and major affecting area in smart city concept is presented. Second, the basic concepts, definition and the working domain is presented. Third, a theoretical model of city that is smart in nature is presented. This chapter gives the basic concept to do the research and implement the smart city concept. This chapter also shows that how an environment condition can affect smart city concept.

Case Studies on Explainable AI in Practice

Deepa Bhora (Amrapali University (AU))*

The study focuses on the classification and prediction of Indian music. The importance of music classification and prediction in Indian music is discussed. A literature review is conducted, highlighting previous research and challenges in this field. The methodology involves data collection, preprocessing, feature extraction, model selection, and evaluation. The findings include the assessment metrics in addition to the classification and prediction outcomes. The discussion then turns to an examination of the findings and a comparison with previously established procedures. Limitations and future work are also considered. In conclusion, this study provides contributions to Indian music classification and prediction, with implications for music technology and industry.

Legal and regulatory aspects of data privacy in AI

Yogesh Chandra (Amrapali University (AU))*

Artificial intelligence (AI) is a term for a technology that uses some level of intelligence to do a job that used to be done by a person. AI has been studied and used in many business tasks, like manufacturing, marketing, managing the supply chain, and managing human resources. The advent of AI has fostered a culture of adaptability and creativity. Talent management is one area where AI has been widely used, with uses ranging from the first stages of the hiring process (recruitment) through the last stages (analysis of employee sentiment and provision of self-service for workers with common questions about the company). Employees may take advantage of AI-enabled self-service for talent management in a number of different ways, including data management, role and task support, competence.

Intelligent information retrieval and business intelligence

Harmanpreet Kaur (Amrapali University (AU))*

Intelligent information retrieval and business intelligence are two crucial fields in today's rapidly evolving technology landscape. Intelligent information retrieval refers to the process of utilizing artificial intelligence algorithms to extract meaningful information from large amounts of data. Business intelligence, on the other hand, is a set of methodologies, processes, and technologies used to turn data into actionable insights for decision making. This paper aims to explore the integration of intelligent information retrieval into business intelligence and the resulting benefits. The paper will present three case studies to demonstrate the impact of intelligent information retrieval in different industries.

Developing a Multi-Class Object Detection Framework for Improved Image Processing in Autonomous Systems

Jayshree Kandpal (Amrapali University (AU))*

The ability to detect objects accurately and quickly is crucial for a variety of autonomous systems, including blind navigation, space exploration, and computer vision. However, existing object detection methods are limited in their accuracy and efficiency, especially for multi-class image processing. This study aims to address this gap by proposing a novel multi-class object detection framework for improved image processing in autonomous systems.
The proposed framework utilizes deep learning techniques to accurately detect objects in multi-class images and can be integrated with existing hardware systems. The framework was evaluated on a large dataset, and results were compared to existing object detection frameworks. The proposed framework demonstrated improved accuracy and efficiency, making it a valuable contribution to the field of computer vision and image processing for autonomous systems.

Malware-BERT: Enhancing Evasive Malware Detection with Multi-Head BERT Attention with Hybrid BERT models

Neha Nandinee (Manit Bhopal)*

The increasing sophistication of malware presents a growing threat to cybersecurity, particularly with techniques designed to evade traditional detection methods. Signature-based and heuristic-based approaches often fall short in identifying novel or evasive malware, necessitating the development of more advanced detection techniques. This paper introduces Malware-BERT, a model specifically designed to detect evasive malware embedded in PDF documents. Using the newly developed dataset, Evasive-PDFMal2022, which includes 5,557 malicious and 4,468 benign samples, the model incorporates BERT embeddings and multi-head attention mechanisms for enhanced detection capabilities. The study demonstrates the effectiveness of Malware-BERT, achieving an accuracy of 96% using the RoBERTa model. These findings emphasize the potential of hybrid BERT-based architectures in improving cybersecurity defenses against complex PDF-based malware.

Experimental investigation of the active and passive passenger cooling solutions on small three-wheeler vehicle

Reetu Jain (On My Own Technology)*

This study examines the effectiveness of active and passive cooling systems for auto rickshaws—small three-wheeled vehicles—operating in hot climates like Rajasthan. Using jute fiber as a heat sink, the study contrasts two passive cooling systems based on the Bernoulli principle with a traditional air conditioning system (active cooling). The energy efficiency of passive systems is demonstrated by an evaporative cooler using only 0.06 kWh per hour, compared to the active cooling system's 0.39 kWh per hour. A square duct and a NACA duct were the two entrance types utilized by the passive systems. According to experimental results, the temperature was lowered by 8°C for both designs, with the NACA duct showing a more consistent exit temperature profile.

Crop Disease Detection and Treatment Recommendation: A Deep Learning Based Image Classification System

Reetu jain (On My Own Technology)*

Agriculture is a cornerstone of the global economy, employing over 1.23 billion individuals in farming-related activities. The first challenge that agri-farmers experience is the early detection of crop diseases and their eventual classification. If not acted upon immediately, these will eventually lead to significant crop losses in agriculture, poverty, and food insecurity problems. The traditional methods of disease detection depend on manual inspections, which are labor-intensive, inexact, and unfeasible for vast agricultural areas. There is an urgent need for automated systems that can rapidly and accurately identify diseases to provide actionable information for proper treatment.
This research will focus on the development of a CNN-based image classification model that is specifically designed to detect and classify crop diseases from leaf images. In this way, the diagnosis can be timely and accurate for farmers.

Advancements in Big Data Analytics for Edge Devices by using Edge Intelligence System

Dr Sanjeev Kumar (Tula's Institute Dehradun)*; Mohit Kumar (Uttaranchal University); Ajeet Vishwakarma (Dev Bhoomi Uttarakhand University)

The rapid proliferation of Internet of Things (IoT) devices has led to an exponential growth in data generation at the edge of the network. These edge devices, equipped with sensors and actuators, gather vast amounts of data from the physical world, creating a wealth of opportunities for real-time analytics and decision-making. However, traditional centralized cloud-based big data analytics architectures face challenges in handling the sheer volume and velocity of data, along with the latency introduced by data transmission to distant data centers.
This research paper presents a comprehensive review of the recent advancements in Big Data Analytics for Edge Devices. The paper discusses the fundamental motivations behind edge analytics and its significance in enabling real-time and low-latency applications. It explores the key technical challenges associated with processing and analyzing data at the edge, such as resource constraints, data heterogeneity, and privacy concerns.

Experimental Study Of Framework For Bike Seat To Protect From Summer/Rainy Season

Abhay Dhasmana (Uttaranchal University)*

The scientific community is increasingly focusing on innovations in the automotive sector, as evidenced by advancements like the introduction of electric vehicles. This paper aims to address a common discomfort faced by motorcycle riders—overheated seats during summer and wet seats during the rainy season—by presenting a smart solution integrated into the bike seat. The proposed system introduces a pipe frame constructed from Acrylonitrile Butadiene Styrene (ABS) material, characterized by a diameter of 5 mm, a length of 300 mm, and 0.3 mm pores. This frame is designed to be embedded within the foam padding of motorcycle seats.

Advanced Space Debris Capture And Storage System With Re-Entry Capabilities

Abhay Dhasmana (Uttaranchal University)*

The advancement of several technologies and methodologies, in addition to numerous different fields, has furthermore boosted the pursuit of space exploration. Space debris has grown significantly due to

the recent, exponential expansion in space missions, endangering satellites, spacecraft, and the safety of space operations. The efficiency of traditional space debris management techniques is limited, and they frequently call for expensive and complicated solutions. An advanced system that can precisely collect, handle, and store space debris is desperately needed, as well as offers a sustainable and safe way of handling it. This invention's Advanced Space Debris Capture and Storage System provides a comprehensive answer to the growing space debris issue. With the use of a variety of sensors, such as laser and ultrasonic sensors, the system can precisely target and analyze space trash for eventual collection.

Liquid Helium Cooling Technique for Re-Entry Capsules: An Advanced Thermal Management System

Abhay Dhasmana (Uttaranchal University)*

Spacecraft encounter extremely high temperatures upon re-entering Earth's atmosphere because of the tremendous heat produced by atmospheric friction. Conventional thermal management systems frequently struggle to dissipate heat effectively, putting crew safety and structural integrity at risk. The research presented here suggests a sophisticated cooling system that uses liquid helium as a coolant and can effectively control heat during re-entry to address this important problem. The primary objective of this research is to create and assess a new liquid helium cooling system that can be installed into re-entry capsules to improve thermal protection and ensure optimal operation under extreme circumstances.

Advancing Additive Manufacturing: Integrating Industry 4.0 And 5.0 Technologies to Revolutionize Production Technique

Abhay Dhasmana (Uttaranchal University)*

Leveraging a Computer-Aided Design model, additive manufacturing is becoming an innovative technique for producing bespoke parts and complex shapes. Using 3D printing methods including Vat Photopolymerization, Material Jetting, Binder Jetting, Powder Bed Fusion, Material Extrusion, Directed Energy Deposition, and Sheet Lamination, this process uses data from a computerized blueprint of the needed model to build it. This overview highlights the usage and applications of different 3D printing technology. The integration of additive manufacturing with Industry 4.0 and Industry 5.0 technologies is also covered in this study.

Attention Mechanisms in Text Recognition: Exploring the role of attention modules in improving text localization and recognition performance

Dr. Madhav Sharma (Poornima University Jaipur)*

The fast advancements in deep learning have substantially more suitable the capabilities of textual content popularity structures, especially in the context of detecting and recognizing textual content from complex visual scenes. Attention mechanisms, mainly self-interest and transformer-based totally fashions, have played a pivotal position in enhancing the performance of text localization and popularity obligations. This paper explores the mixing of attention modules in modern textual content reputation frameworks, focusing on their effect on both text localization and recognition accuracy.

Poultry Disease Detection and Poultry Health Diagnostics: A Deep Learning Perspective

Vishwas B (Dayananda Sagar University)*; Dharmendra D P (Dayananda Sagar University); Deepak H G (Dayananda Sagar University); Chethan K S (Dayananda Sagar University); Santhosh M (Dayananda Sagar University)

The poultry market in India is now growing at an annual pace of 8.1%. However, infectious diseases pose a serious threat to this industry's expansion and advancement in our area. Newcastle, Salmonella, and Coccidiosis are common viral illnesses that affect poultry production and pose a serious financial risk to the sector if they are not detected in a timely manner. Traditional disease detection techniques for poultry include time-consuming and demanding manual methods. Our experiment, which classifies healthy and unhealthy fecal images, highlights the promise of Deep Learning approaches for accurate disease diagnosis in poultry. Robust image analysis is achieved by training deep learning models such as CNN, VGG16, and MobileNet V3 on large, annotated datasets that include images of both healthy and diseased poultry for robust analysis.

Innovative 3D Textile Design: Integrating Japanese Mesh Work, Weaving Derivatives, and Monochromatic Color Effects for Visual Illusions

Rekha Sharma (Jaipur National University)*

This research ambitions to broaden progressive three-D fabric design samples that create visual illusions through the mixing of Japanese mesh paintings strategies, fundamental weaving derivatives, and monochromatic color weave outcomes. By combining conventional craftsmanship with modern layout techniques, the look at explores the introduction of hybrid fabric systems that decorate depth belief and visual complexity. The take a look at focuses on three center targets: (1) the layout development of hybrid systems that merge Japanese mesh work with woven material bases, (2) fabric and approach optimization to make certain sturdiness, flexibility, and aesthetic appeal, and (3) the software of monochromatic shade theory to attain more suitable optical illusions. This research contributes to the advancement of fabric design by using imparting new perspectives on visible aesthetics and three-dimensional textile production.

Enhancing Cybersecurity with Hybrid Feature Selection and Ensemble Stacking Classifiers

Sainath Patil (Vidyavardhini's College Of Engineering And Technology Vasai)*

In today's digital landscape, web applications play a vital role in business operations but are increasingly targeted by sophisticated cyberattacks. Traditional security measures often fail to detect complex threats, necessitating advanced solutions that leverage machine learning and data analytics. This study proposes a novel methodology for web server attack detection by integrating a hybrid wrapper-based feature selection technique with an ensemble stacking model. The ensemble stacking model employs Decision Tree, k-Nearest Neighbor, Random Forest, and Extreme Gradient Boost classifiers as base learners, with Logistic Regression as the meta-classifier. Experiments conducted on the UNSW-NB15 dataset demonstrate the superior performance of the proposed model, achieving 99.45% accuracy, with precision, recall, and F1 scores exceeding 99%. These results outperform state-of-the-art approaches in the literature with low computational overhead.

Deep Learning for Maritime Detection: Custom CNN Approach Using Satellite Images

Nandini S (JSSSTU)*

The present work seeks to create a machine learning model which is capable of detecting ships in satellite images and employs a dataset obtained from Kaggle's "Ships in Satellite Imagery" collection. The raw raster images of coastal areas are included into the dataset, the focus being in identifying and classifying the presence of ships. A convolutional neural network (CNN) that for the purposes of this study was specifically built from the ground up to suit the specific needs of the dataset under consideration. The model performance has been assessed using model evaluation metrics such as accuracy, precision, recall, F1-score and confusion matrix. The results of the study show that the model is effective in detecting ships so that it can be used in maritime surveillance and environmental monitoring applications. Expansion of the dataset and further optimization of the model architecture would help in further enhancement of the results.

Integration of Deep Learning with Computational Fluid Dynamics for Hemodynamics Diagnosis

Jitendra Kumar (IIMT College Of Management Greater Noida)*

Computational fluid dynamics (CFD) modeling of blood movement is pivotal in advancing our understanding of various cardiovascular conditions, optimizing drug delivery systems, besides designing innovative diagnostic besides treatment methods. Despite advancements in precise technology, the high cost of these simulations limits their transition from research to clinical application. This limitation is especially significant in patient-specific CFD simulations, Recently, deep learning (DL) methods have shown promise in accelerating hemodynamics simulations by reducing precise demands. This review examines recent efforts to integrate DL with CFD, exploring its applications in hemodynamic studies of the aorta besides cerebral arteries besides identifying potential future directions. We suggest that combining physiological insights with fluid mechanics principles within DL models could drive a transformative shift toward non-invasive precise tools in clinical decision-making.

Surveying Investor Awareness and Views on Platforms Utilizing AI Tools for ESG-Based Analytics

Neha Rastogi (Uttaranchal University)*

In accordance to the study, only 20% of investors use AI-driven platforms for ESG data, indicating a lack of awareness and engagement with these tools. Sustainalytics is the most well-known platform; user interface and data accuracy are important determinants of choice. To increase the use and attractiveness of AI-based ESG platforms, the study recommends customised communication tactics and user training

A Survey on Change Detection in Synthetic Aperture radar Satellite images

Saili Sable (Nutan College Of Engineering And Research); Omkar Unde (Student)*; Aditya Jadhav (Nutan College Of Engineering And Research); Deepak Singh (Nutan College Of Engineering And Research)

Change detection in Synthetic Aperture Radar (SAR) images is critical for urban planning, disaster management, and environmental monitoring. SAR's ability to operate in all weather and lighting conditions makes it indispensable for tracking Earth's changes. However, differentiating man-made alterations from natural variations, such as vegetation growth or seasonal water changes, remains challenging.Hybrid approaches that combine traditional methods like Change Vector Analysis (CVA), Principal Component Analysis (PCA), and Fuzzy C-Means (FCM) with deep learning techniques, such as self-supervised learning and contrastive loss functions, show promise in reducing false positives and enhancing accuracy. Experimental studies using the Sentinel-1 dataset highlight the strengths and limitations of these methods, with outputs in GeoJSON and shapefiles proving useful for GIS-based monitoring systems.This survey emphasizes the need for scalable, accurate solutions.

Zero-Shot Learning: Enabling Deep Learning Models to Recognize Unseen Categories

Dr. Madhav Sharma (Poornima University Jaipur)*

Zero-shot studying (ZSL) represents a innovative technique to deep understanding acquisition, permitting models to become aware of and classify studying that has not been encountered across faculties. By the usage of semantic illustration and embedding techniques, ZSL addresses the limitations of conventional supervised gaining knowledge of, which is based closely on categorised information This paper explores ZSL's theoretical foundations, techniques and applications. The paper identifies states of concern on crucial functions related to ZSL, together with troubles of switch and semantic holes, and explores contemporary trends such as gaining knowledge of and numerous foundational models. The findings spotlight the potential of ZSL to redefine the device to gain information of scalability while simultaneously offering the roadmap for enrichment improvement.

Churn Prediction in Telecom: Insights from Customer Behavior and Predictive Modeling

Kopparthi Lokesh (Kalasalingam University)*

This paper presents a machine learning-based churn prediction system for the telecom sector, focusing on decision trees and ensemble models. The system includes core modules: Exploratory Data Analysis, Data Preprocessing, Model Training, and Deployment. Data from CRM systems and customer interactions is pre-processed, with categorical encoding, feature normalization, and missing data handling. EDA identifies key churn factors, while machine learning algorithms like Random Forests, Logistic Regression, and Decision Trees are trained using Scikit-learn and PyCaret, with deep learning models (TensorFlow/Keras) for complex patterns. The approach enables proactive retention strategies and supports sustainable industry practices by predicting churn accurately and promoting data-driven innovation. Recommendations are provided for telecom operators seeking scalable, automated solutions.

A Multimodal Anonymization Framework for MP4 Videos

Sandip Shinde (Vishwakarma Institute of Technology); Arya Pathak (Vishwakarma Institute of Technology)*; Shreya Mohite (Vishwakarma Institute of Technology); Sanchitsai Nipanikar (Vishwakarma Institute of Technology); Keyur Pande (Vishwakarma Institute of Technology)

This paper presents a comprehensive multimodal anonymization framework for MP4 videos, addressing privacy concerns related to text, facial features, and audio. The proposed system processes input videos by independently anonymizing embedded text, human faces, and audio streams through specialized pipelines while maintaining temporal and spatial coherence. Text anonymization leverages optical character recognition (OCR) for detection and employs redaction or pseudonymization techniques to ensure privacy. Facial anonymization uses advanced generative models to replace sensitive facial regions with realistic, privacy-preserving synthetic alternatives. Audio anonymization modifies speaker-specific features to eliminate re-identification risks while retaining semantic integrity. Experimental results demonstrate the system's ability to achieve high privacy protection without significant degradation in video utility.

Exploring Regularization And Channel Optimization In Motor Imagery Eeg

Dharshana S (Kongu Engineering College)*; Gayathri V P (Kongu Engineering College); Devisurya V (Kongu Engineering College); Bhavya D S (Kongu Engineering College); Bharathi K (Kongu Engineering College)

Motor imagery (MI) using electroencephalography (EEG) signals enables non-invasive interaction with the environment, crucial for brain-computer interfaces (BCIs). However, EEG's low signal-to-noise ratio (SNR) and non-stationary nature present challenges for accurate classification. This study compares traditional machine learning algorithms, such as Random Forest and XGBoost, with deep learning models, including Artificial Neural Networks (ANNs), for motor imagery classification. It also investigates ensemble and hybrid models to improve performance. Results show CNN-based approaches excel in spatial-temporal feature extraction, but combining traditional and deep learning methods enhances accuracy and generalization, outperforming existing CNN models. This research emphasizes hybrid approaches for addressing EEG classification challenges and optimizing BCI applications.

Keywords: hybrid, generalization, feature, accuracy

Blockchain Application for Sustainable Supply Chain Management in Indian Agriculture

Pugazhendi A (IFET College Of Engineering)*; Chandru K (IFET College Of Engineering); Manvizhi N (IFET College Of Engineering)

The increasing demand for transparency in the agri-food sector, driven by consumer demand and regulatory requirements, has accelerated blockchain adoption. Blockchain's trusted and immutable nature is ideal for enhancing traceability and combating food deception while informing consumers about the product's origin. To meet this need for safe and transparent supply chain transactions, Ethereum-based Smart Contract technology is being improved. However, data migration and update issues have driven many in the industry to Binance Smart Chain (BSC). BSC provides faster confirmation of transactions, a more efficient consensus mechanism, and greater scalability. These

features allow for the smooth updating of smart contracts, thereby speeding up, making them more reliable, and transparent blockchain solutions in agri-food supply chains.

Towards Green AI: Reducing the Environmental Impact of Machine Learning Models

Dr. Madhav Sharma (Poornima University Jaipur)*

The rapid increase of device gaining knowledge of (ML) technologies has introduced transformative advancements throughout numerous domain names, consisting of natural language processing, computer imaginative and prescient, and selection-making structures. However, this progress comes at a steep environmental value, normally because of the considerable computational assets required to train and deploy big-scale fashions. Recent research have found out that education modern-day fashions, which includes GPT and BERT, can devour as an awful lot strength as powering a couple of families for an entire yr, main to giant carbon emissions. This urgent problem necessitates a shift in awareness from simply optimizing performance metrics to integrating power performance and sustainability into the design and improvement of ML systems.

Deep Learning based road condition monitoring for intelligent transportation system

Dr. Kapil Joshi (Uttaranchal Institute of Technology, Uttaranchal University, Dehradun)*

Continuous monitoring of the state of the roads and making use of improvements in vehicle technology can reduce the cost of road maintenance by road authorities. The current techniques employed by competent people in carrying out manual observations with the aid of standard survey forms can hardly provide real-time information, are expensive, time-consuming, and not usual. There are also some automated techniques, however, these are expensive because they require certain cars with sensors and computers for data gathering and analysis. The motive of the research is to develop a low-cost real-time road condition monitoring technique. You Only Look Once, (YOLOv11) was used in this study to create a deep learning model that was trained to identify and classify flexible pavement distresses (FPD) with 96% accuracy, 94.7% recall, and 97.8% mean Average Precision.

Visual Analysis of Surveillance Videos for Abandoned Object Detection using Convolutional Neural Network

Dr. Kapil Joshi (Uttaranchal Institute of Technology, Uttaranchal University, Dehradun)*

Significant security dangers, such as possible terrorist threats, criminal activity, and public safety problems, are presented by abandoned items in public areas. Video stream surveillance done by hand is time-consuming and prone to human mistakes. This research examined the use of Convolutional Neural Networks (CNNs) for automatic abandoned item recognition in surveillance videos. The proposed system analyses video frames, extracts pertinent information, and recognizes things that stay still for a long time using a deep learning architecture. Gaussian mixture models are used to detect stationary items at the start of the process, followed by convolutional neural networks for abandoned object recognition which are trained using a sizable dataset of annotated surveillance videos. The

ability to identify stage objects helps reduce bias caused by shadows or lighting changes by identifying the bounding box of objects that are left behind.

FlowLearn : Period Tracking and Empowering Learning

Madhu Kirola (Uttaranchal University, Dehradun)*

The idea of "SheCare" is very creative as it emerges as a revolution in old myths and beliefs where technology will redefine our approach constantly related with menstrual education. Beyond all the limitations of traditional and already developed period-tracking apps, this web application focuses more on educational power and on a personalised report of suggestions. It is a unique combination that goes beyond simple health monitoring. SheCare is like a personal tutor for every individual who will focus on different body behaviours of every user as it creates a personalised study plan based on the list of questions they ask, just for them. It provides many other services like reminders, educational content like myth vs facts.

Growth of Green Eco Automobile' in India: Impact on Green Marketing EV charging infrastructure in Automobile Industry: Opportunities and Challenges

Madhu Kirola (Uttaranchal University, Dehradun)*

A crucial move in the battle against global warming and lower emissions of greenhouse gases is the fast transition towards electric vehicles (EVs). The demand for charging infrastructure that would facilitate integration of EVs into urban transport networks necessitates the availability and accessibility of enough charging points as more people continue to embrace electric mobility, especially through electric two-wheelers. This study seeks to examine trends in growth for electric scooters, estimate demand for charging posts, and give an overview of challenges and obstacles associated with development of EV charging infrastructure. The study has employed a system review of literature, data analysis, as well as predictive modelling to achieve its objectives. The paper further investigates economic, consumer awareness and cybersecurity challenges that need to be addressed for wide acceptance of EVs and their supporting infrastructures.

Smart IoT-Based System for Vehicle Accident Prevention and Detection

princy tyagi (Swami Rama Himalayan university)*

The use of automobiles for transportation in India has surged significantly during the past several decades. A rise in the quantity of cars utilised for transportation results in recurrent accidents and traffic congestion. Deviations in traffic patterns and noncompliance with traffic regulations are often the primary contributors to accidents. Driver mistake precipitates vehicular incidents, whereas adverse weather conditions may occasionally lead to accidents. Despite recent technological breakthroughs in car safety, accidents continue to occur daily. This methodology is an excellent means of identifying and preventing automobile crashes, which is crucial. The ultrasonic sensor prevents accidents and transmits an alarm message. In the event of an accident, it transmits a warning message via an accident detecting sensor.

Composite materials using AI techniques for aerospace application: Review

Abhay Dhasmana (Uttaranchal University)*

The development and application of composite materials pose multifaceted challenges such as the long discovery processes, expensive prototyping, inefficient manufacturing workflows, and environmental sustainability. The traditional methods of material discovery are based on lengthy experimentation and iterative design that prolong the research and development cycles. Additionally, manufacturing processes often suffer from inefficiencies, defects, and inconsistencies, raising the cost of production and generating a tremendous amount of material waste. These have additional environmental implications in terms of difficulties in recycling and reliance on non-renewable resources, which conflicts with the emphasis on sustainability and circular economy goals. The use of artificial intelligence in the research and manufacture of composite materials marks a revolutionary solution to these problems.

INTEGRATION OF MACHINE LEARNING IN COLD STORAGE SYSTEMS FOR ENHANCED GRAIN PRESERVATION

Abhay Dhasmana (Uttaranchal University)*

In most Asian Countries, the preservation of grains is a critical challenge due to the rapidly changing climate and persistent pest infestations. These changes in temperature and humidity, coupled with poor strategies for pest management, are a stimulus towards the spoilage of grains. This problem is further enhanced by a lack of real-time monitoring and control systems that can help maintain consistency in the storage conditions. Most traditional methods of storage often cannot maintain the optimum conditions against grain spoilage since they are not designed to adapt to dynamic environmental factors, thus leading to post-harvest losses and increasing the economic burden on farmers. This hereby requires an intelligent cold storage system that combines many advanced technologies—in particular, IoT sensors, machine learning, and autonomous systems.

Speech Reconstruction from Visual Lip Movements Using Deep Learning

Archana Pottem (Vishnu Institute Of Technology)*

Audio-less video-to-speech conversion is a challenging problem that has gained significant attention. It involves extracting relevant acoustics from videos without audio recordings. The av_hubert algorithm addresses this by integrating audio-visual properties to align audio with visual features, leveraging a deep learning architecture that combines these modalities to enhance speech recognition accuracy. By associating lip movements with corresponding phonetic information, av_hubert efficiently transcribes speech from audio-less videos. Advanced techniques, such as attention mechanisms, multistream fusion, and pre-training on large datasets, further refine transcription quality. This approach has shown promise in applications like video captioning, indexing, and accessibility for the hearing impaired. In summary, the av_hubert algorithm offers a robust solution for converting audio-less videos into speech by utilizing rich audio-visual signals in the visual stream.

Building Information Modeling (BIM) and Artificial Intelligence: Transforming the Future of Construction and Design

gaurav thakur (uttaranchal university)*; Ekansh Rawat (Uttaranchal University)

Building Information Modeling (BIM) and Artificial Intelligence (AI) are precipitating a paradigm shift within the realms of construction and architectural design by augmenting efficiency, exactitude, and innovative potential. BIM operates as a cooperative platform, amalgamating all pertinent data into a cohesive model, thereby facilitating superior visualization, coordination, and decision-making processes. In concert with AI, this technology empowers automated procedures, prognostic analytics, and astute design methodologies. This research scrutinizes the interplay between the two, with a particular emphasis on project planning, risk evaluation, energy optimization, and the management of built facilities. Notable advancements, such as generative design, clash detection, and real-time monitoring, underscore the profound influence they exert on the industry's metamorphosis.

EfficientResNet: Hybrid CNN for Image Classification with LIME Visualization

Ankit Chamoli (Uttaranchal university)*; Sumit Chaudhary (Uttaranchal university); Roosha Shamoon (Uttaranchal university)

This work attempts to address the critical challenges of achieving both high performance and model interpretability for image classification tasks. ResNet50 and EfficientNetB0 are examples of deep learning models that have revolutionized computer vision by offering excellent accuracy and computational efficiency, respectively. However, their standalone implementations often fail to balance these attributes. We address this with a hybrid deep learning model combining the feature extraction strength of ResNet50 with a lightweight architecture of EfficientNetB0. This creates a robust framework for image classification.
The proposed hybrid model is tested on the MNIST dataset to demonstrate effectiveness in terms of classification accuracy and computational efficiency. Apart from performance metrics, the study incorporates the LIME technique to enhance model transparency by visualizing critical regions in input images that influence predictions.

Machine Learning-based Classification of Human Cancer Subtypes using Multi-Omics Data

Jitendra Gupta (Uttaranchal Institute of Technology, Uttaranchal University, Dehradun)*

The classification of cancer subtypes is critical for accurate diagnosis, prognosis, and personalized treatment. With the advent of high-throughput technologies, multi-omics data including genomics, transcriptomics, epigenomics, and proteomics have become widely available for cancer research. Machine learning-based approaches have been widely adopted for cancer subtype classification due to their ability to handle high-dimensional and complex data. This paper provides an overview of multi-omics data analysis in cancer research and the application of machine learning-based classification techniques for cancer subtype classification.

Real-time Image Segmentation Using Edge Computing: A Comparative Analysis of Performance and Suitability

Anuradha Brijwal (Uttaranchal Institute of Technology, Uttaranchal University, Dehradun 248007, India)*

Real-time image segmentation system using edge computing and evaluates its performance using benchmark datasets. Image segmentation is a crucial step in many computer vision applications, and edge computing is a new computing paradigm that allows data processing to be performed closer to the source. The proposed system is implemented on an edge device consisting of an FPGA board, a camera module, and a microcontroller. The system architecture comprises three main components: image acquisition, edge detection, and region segmentation. The system uses a modified Sobel operator for edge detection and a connected-component algorithm for region segmentation. The performance of the system is evaluated in terms of accuracy, latency, and resource utilization. The proposed methodology provides a solution for real-time image segmentation, which can be used in many computer vision applications.

A Machine Learning approach to predict Customer Behavior on OTT Platforms

Sumit Chaudhary (TransStadia University)*

In India, the entertainment industry is being transformed rapidly by the Internet. OTT is another technology which provides television and film content via the internet based on an individual's requests and needs. In contrast to traditional television platforms, OTT doesn't rely on cable, broadcast, or satellite companies to control or distribute content. There has been an increase in popularity and usage of OTT platforms since their launch. However, since the pandemic, the popularity of these platforms has grown exponentially as people's consumption patterns have changed as a result of the pandemic. Consumers are now more inclined towards digital platforms also known as over-the-top (OTT) platforms. Traditional television viewing experiences lack the quality and diversity that OTT platforms offer, which explains their popularity gains.

A review on Tube Heat Exchanger analysis for heat transfer with various parameters inserts

Sanjeev Joshi (Uttaranchal Institute Of Technology,Uttaranchal University)*; Saurabh Aggarwal (Uttaranchal University); Ruby Pant (Uttaranchal University)

The problem that is continuously being investigated involves enhancement of heat transmission. There exist three methods (passive, active, and compound) to enhance heat transfer. The passive method doesn't require external energy and is commonly used in studies. The main purpose of this investigation is to mix the flow to eliminate boundary layer formation and to enhance the heat transfer between the wall and the flow. In this study, the main focus is kept on passive technique with the aim to develop a light weight heat exchanges so as to reduce the time and effort required to achieve the optimal design.

Strategically Designing of Electric Vehicle Charging Stations within Power Distribution Network

Priyanka Chauhan (Uttaranchal University)*

Paper presents a robust approach for optimizing the planning of EV charging stations by integrating a two-step screening method with a modified primal-dual interior point algorithm. The initial phase utilizes the two-step screening method to account for environmental factors and service radii,

effectively identifying optimal locations for charging stations. Following this, a mathematical model is developed for the optimal sizing of these stations, which is efficiently addressed using the MPDIPA. The approach leverages the sparse structures of correction equations, significantly accelerating the solving process. Simulation results based on the IEEE 123-node test feeder validate the proposed model's effectiveness, demonstrating improved planning for EV charging stations that reduces network losses and enhances voltage profiles. These findings highlight the critical role of strategic site selection and optimal sizing in developing EV infrastructure.

Material-Centric Optimization of GAAFETs: Evaluating Si, SiC, and GaN for Next-Generation Semiconductor Application

Soumya K V (New Horizon College Of Engineering); Adinarayana V S (New Horizon College Of Engineering); Harshitha S (New Horizon College Of Engineering)*; Likhitha M (New Horizon College Of Engineering); Harshavardhan P R (New Horizon College Of Engineering); Niranjan Sharma S H (New Horizon College Of Engineering)

This project presents a comprehensive study of Gate-All-Around Field Effect Transistors (GAAFETs) utilizing three distinct materials—Silicon (Si), Silicon Carbide (SiC), and Gallium Nitride (GaN)—to address the limitations of conventional MOSFETs in advanced semiconductor applications. Leveraging the ATLAS device simulator, the research evaluates critical performance metrics such as threshold voltage, on/off current ratio, subthreshold slope, and transconductance. Additionally, a comparative analysis explores material-specific advantages, highlighting Silicon's scalability and electrostatic control, SiC's exceptional thermal conductivity and robustness, and GaN's superior electron mobility and power-handling capabilities. This research advances the design and optimization of GAAFETs, addressing challenges like short-channel effects and leakage currents, and contributes to scalable, energy-efficient semiconductor technologies for next-generation electronics

Load Balancing Algorithms in Cloud Computing Environment

Pratibha Dimri (Uttaranchal University)*

Cloud computing is a concept that is still developing in the IT environment and has significant infrastructure and resource requirements. In fact, this is causing a sharp rise in both the volume of traffic to cloud servers and the number of service requests. This growing trend poses significant difficulties for the cloud load balancer's already difficult task of efficiently balancing the load. The technique of load balancing in clouds divides the extra dynamic local burden equally among all the nodes. It is used to improve the system's overall performance by obtaining improved service delivery and resource consumption statistics. This article discusses about Load balancing concepts, challenges faced and various algorithms.

Intelligent Tourism Management Information System Using Argumentation-Based Model

Anurag Kumar (Uttaranchal University)*

Modern travel planning necessitates intelligent systems to simplify decision-making amidst information overload. The Intelligent Tourism Management Information System (ITMIS) aims to

predict tourist preferences from reviews and provide personalized recommendations. ITMIS integrates HTML, CSS, PHP, MySQL, and an argumentation-based model employing machine learning and natural language processing techniques. The intuitive UI utilizes HTML & CSS, while PHP enables dynamic scripting, and MySQL serves as the centralized data store. The argumentation model analyzes tourist reviews for sentiment analysis and preference prediction. The proposed system offers an innovative framework for personalized travel planning by extracting insights from unstructured data. It addresses information overload, enhances user experience through modern web technologies, and enables scalable data integration.

Comparative analysis of various deep learning algorithms for Skin Cancer Disease

Rohan kukreti (Uttaranchal University)*

These days, skin illness among people has been a common illness, particularly in America millions of individuals are enduring from different sorts of skin illness. As a rule, these maladies have covered up perils which lead to human not as it were need of self-confidence and mental discouragement but too a chance of skin cancer. Determination of these sorts of illnesses as a rule required therapeutic specialists with high-level disobedient due to a need of visual determination in skin infection pictures. d distinguish between benign tumour's and melanoma. This article provides detailed information about deep learning techniques for early skin detection. Research articles published in reputable journals on the subject of cancer screening were examined. Research findings are presented in the form of tools, graphs, tables, methods and procedures for better understanding.

Enriching Visual Narratives: Challenges and Future Prospects in Image Captioning for the Hindi Language

Gaurav Negi (Uttaranchal University)*

The interdisciplinary field between computer vision and natural language processing, called image captioning, applies to describe photographs evocatively. Although Hindi is one of the most complex languages in terms of the subtlety of its morphology and context, problems still persist when trying to extend picture captioning from English to Hindi. This project paper describes some challenges and opportunities in developing models for Hindi picture captioning. Topics we address include data scarcity for training, lexical variety, how to handle named entities, and idiomatic expressions. We discuss the importance of domain-specific captioning and the need for multimodal pretraining in order to effectively align vision and language. Finally, we make suggestions for future work, including the transfer of learned knowledge from English to other languages, improved evaluation methods, and interactive captioning.

Exploring the Implementation of Lean Tools across Different Manufacturing Sectors

Jitendra Kumar (Uttaranchal University)*

The rapid evolution of global markets and increasing consumer demand for high quality products at lower costs have made efficiency in manufacturing a critical factor for success. Lean methodology, which focuses on waste reduction and value creation has emerged as an approach like key for achieving operational excellence across various manufacturing sectors. This paper explores the

implementation of lean tools across different manufacturing sectors, comparing their applications, challenges, and outcomes. By a comprehensive review of literature, case study and practical insights, the study highlights the significance of lean tools such as Value Stream Mapping (VSM), 5S, Kaizen, Kanban, Total productive Maintenance (TPM) and others. This research aim is to provide an understanding of how these tools are tailored to the unique requirements of different industries and the factors that influence their successful adoption.

The Rise of Digital Advertising and Its Effects on Consumer Behaviour: A Comparative Study of Traditional vs. Digital Advertising

Neelima Singh (Uttaranchal University)*

Digital advertising has witnessed significant growth in recent years, revolutionizing the way companies reach and engage their target audience. This research paper aims to explore and compare the effects of traditional and digital advertising on consumer behaviour. By analysing consumer perceptions, attitudes, and responses towards both advertising mediums, the study aims to provide valuable insights for marketers and advertisers in designing effective communication strategies.

Transforming Plastic Waste into Sustainable Fuel A Pathway to Renewable Energy

Ashish Pathani (Uttaranchal University)*

Recently, there has been an increase in attention to using plastic trash as a fuel source. Pyrolysis, gasification, and liquefaction are highly efficient processes by which crude oil can be extracted from plastic waste. The popular method for turning plastic waste into fuel is pyrolysis. In order to create a mixture of gases, liquid fuel, and solid residue, it needs heating the plastic waste in an environment absent of oxygen. Diesel or petrol can be replaced with the liquid fuel produced by pyrolysis. The gasification process involves heating the waste plastic in the presence of limited oxygen to create syngas, which can be utilized as a fuel for industrial processes or to produce power.

LeukemiaBlood Cancer Detection Using MobileNet

Bindhusha Boda (Kalasalingam Academy of Research and Education)*; Swathi Thati (Kalasalingam Academy of Research and Education)

Acute Lymphoblastic Leukaemia (ALL) is a life-threatening cancer affecting the blood and bone marrow, characterized by the abnormal production of white blood cells (WBC). Due to that the immune system is comprised, and the body becomes more vulnerable to infections as a result of these unhealthy cells crowding out healthy cells. Early and accurate detection is crucial for effective treatment and patient outcomes which is visible in the application proposed. The proposed model offers a robust solution by analysing microscopic images of blood samples to identify leukaemia and its stages. By leveraging a Convolutional Neural Network (CNN) architecture, the model can classify the presence of leukaemia and determine its stages whether it is early pre-B, pre-B or pro-B. If no cancer cells are detected, it displays as benign and provides additional information about the sample, ensuring comprehensive results (based on the accuracy, explained later).

Comparative Analysis of Machine Learning inspired Memetic algorithm under Traveling salesman problem.

Rajiv Kumar (Uttaranchal University)*

There are many optimization problems which exist which have real world importance. such as transportation problems, business decision problems, sequencing problems etc. Traveling salesman problem is benchmark problem to study. When a new meta-heuristic algorithm is developed, most of the researcher considers the TSP for algorithm analysis purposes. It has a wide variety of practical applications, including things like road transportation, scheduling or planning, logistics, the production of microchips, DNA sample, point soldering, and other things. Machine learning is the emerging field of research. In the present paper machine learning inspired memetic algorithms have been developed and compared with the existing mete-heuristic algorithms. The results show that machine learning inspired algorithms shows better results.

Novel Machine learning inspired Memetic algorithm for Combinatorial Problem

Rajiv Kumar (Uttaranchal University)*

This research introduces a novel machine learning-inspired memetic algorithm (MA) framework designed to address combinatorial optimization problems effectively. Five distinct memetic algorithms are proposed by integrating innovative local search techniques. The proposed algorithms include: MA-KM, which employs a K-Mean clustering approach; MA-OL, utilizing the Opposition-Based Learning (OBL) approach; MA-CM, incorporating Circular Sequential Mutations (CSM); MA-KMCM, which combines K-Mean clustering with Circular Sequential Mutations; and MA-KMCMOL, an advanced hybrid approach leveraging K-Mean clustering, Circular Sequential Mutations, and Opposition-Based Learning. The development of these algorithms aims to enhance search efficiency and solution quality by balancing global exploration and local exploitation. .

Sustainable Ai For Environmental Monitoring: A Review Of Challenges And Opportunities

Nandini Prajapati (Uttaranchal University)*

This study provides a deep analysis of the applications of Sustainable Artificial Intelligence and Machine Learning in environmental. The integration of AI with technologies such as the Internet of Things and remote sensing has substantially enhanced real-time environmental monitoring and data-monitoring, covering publications from 1991 to 2024. The research reveals that substantial rise in both publications and citations since 2010, with China, the United States, and India identified as major contributors. Driven decision-making. Noteworthy advancements in AI/ML techniques involve new algorithms for applications such as soil mapping, land-cover classification, flood susceptibility modelling, and remote sensing image analysis. AI has enabled significant improvements in air and water quality predictions, climate impact forecasting, and automated wildlife monitoring through image recognition speech recognition Despite these advances, challenges remain.

Integrating Heuristic Strategies and Deep Learning for Enhanced Optimization of Complex Physical Processes

Dr. Madhav Sharma (Poornima University Jaipur)*

Maintaining physical complexity is important in tasks ranging from production to strength systems. In popular, traditional techniques can't competently cope with the excessive-dimensional, nonlinear dynamic nature of those structures. This paper investigates the combination of heuristic strategies and deep learning techniques to improve optimization effects. The adoption of heuristic strategies which can be recognized to be strong in big solution areas is complemented via predictive characteristic extraction abilities of deep getting to know The proposed device demonstrates progressed performance in technically unbiased methods in a number of conditions together with supply chain optimization, predictive upkeep and energy management Open to more than a few innovative enterprise solutions.

Predicting Equipment Failures in IoT-Enabled Industrial Setups Using Deep Learning: Enhancing Maintenance Efficiency and Reducing Downtime

Dr. Madhav Sharma (Poornima University Jaipur)*

The Industrial Internet of Things (IIoT) has revolutionized traditional production and industrial structures through allowing real-time monitoring, predictive insights, and more desirable operational efficiency. However, gadget failures keep to pose massive annoying situations, major to unplanned downtimes, compromised productivity, and financial losses. This take a look at investigates the ability of deep studying strategies to predict tool failures in IoT-enabled commercial setups. Leveraging the rich, continuous facts streams from IoT sensors, a predictive upkeep framework is proposed, aimed closer to optimizing protection schedules and lowering operational disruptions.

Investigate adaptive scheduling algorithms that balance critical and non-critical task performance while adhering to energy and resource constraints

Dr. Madhav Sharma (Poornima University Jaipur)*

Efficient task scheduling is the cornerstone of modern computing systems, especially in environments where energy and resource constraints are important concerns This paper explores innovative systems designed to improve performance in critical and non-critical tasks intensively to minimize energy consumption and resource consumption Further research and development Through recommendation, we aim to provide a comprehensive acquisition plan balancing performance and durability in different computing environments Experimental studies show that the proposed adaptive algorithm outperforms existing methods in key performance considerations.

A Comprehensive Survey: Impact of AI on Aircraft Stealth

Garima Garg (Uttaranchal University)*

Artificial intelligence (AI) as an emerging technology has found its application in various industries. It has also revolutionized aerospace and defense. The integration of artificial intelligence and machine learning with stealth and low-observable technology has revolutionized the offensive and defensive capabilities of the existing stealth aircrafts. AI has helped to evaluate the shape, designs, materials and configurations that can be optimised to reduce the radar cross- sections and infrared signatures, while

maintaining the performance. Here we want to identify some promising technologies that can improve resilience, responsiveness, range, stealth, performance, endurance and affordability of the existing aircrafts. This survey underscores AI's potential to address the limitations of traditional stealth approaches and highlights the impact of latest AI-enhanced methodologies on Aircraft stealth while citing state-of-the-art research.

Adaptive Frameworks for Cross-Platform Mobile Application Development

Arpit Jain (Koneru Lakshamaiah Education Foundation)*; Vibhor Goyal (Florida State University); Hina Gandhi (Northeastern University); Sangeet Vashishtha (IIMT University)

The rapid evolution of mobile technology has led to the demand for scalable, cost-effective solutions that support cross-platform mobile application development. Adaptive frameworks have emerged as a key enabler of this trend, offering developers the ability to create applications that run seamlessly across multiple platforms while maintaining optimal performance and user experience. This paper explores the concept of adaptive frameworks, focusing on their architecture, design principles, and the advantages they offer for mobile application development. Adaptive frameworks enable the dynamic adaptation of an application's functionality, layout, and performance based on device-specific constraints and user preferences. By leveraging shared codebases, these frameworks reduce development time and cost while ensuring compatibility across various operating systems, including iOS, Android, and web platforms.

Designing Intuitive Interfaces for next- Generatic Wearables

Arpit Jain (Koneru Lakshamaiah Education Foundation)*; Ojas Gupta (Savannah College of Art and Design); Avneesh Kumar (Galgotia's University); Priya Guruprakash Rao (University of Washington)

The rapid evolution of wearable technology presents a unique challenge in designing user interfaces (UIs) that are not only functional but also intuitive and user-friendly. As wearables become increasingly integrated into everyday life, the need for seamless and effective interfaces is paramount. This paper explores the design principles and considerations essential for creating next-generation wearable UIs. Specifically, it addresses the importance of user-centric design, where context-awareness, simplicity, and accessibility are key drivers in interface creation. With wearables becoming more complex in terms of features, sensors, and connectivity, the focus shifts toward minimizing cognitive load and enhancing user experience through intuitive interactions.

An Era of Cognitive Science with Technological Advancements in Artificial Intelligence and Machine learning: A Comprehensive Exploration

Jageshwar Ray (Uttaranchal University)*

From the beginning, it has been a curiosity to understand the mind, behavior and mental processes and as time evolved different methods were developed and started to know it. When it comes to understanding the mind and mental processes, the cognitive methods and its contribution cannot be ignored. Cognitive theories and different technological advancements were taking place like AI and its sub-field ML. These technologies and their impact on cognitive science have shown a greater positive influence and this paper reviews various current and upcoming outlooks of technology in cognitive science to foster its functioning and make life easier where complex issues are still unsolved, using technology with cognitive science can be a boon from every perspective. This shares recent trends in cognitive science and its relation with technology like AI. It has catalyzed a cascade of cognitive theories and technological innovations that continue to redefine the boundaries of cognitive science.

Waste Management Technologies for Circular Economy: Paving A Path Towards Sustainable Development

Reeta Rautela (School of Liberal Arts, Uttaranchal University)*; Namrata Prakash (School of Management Graphic Era Hill University); Shravan Kumar (School of Liberal Arts Uttaranchal University); Harleen Kaur (Jaypee Institute of Information Technology Noida)

The circular economy aims to increase economic development by reducing the pressure on the environment. Digitalization is not only connecting people; it is also serving humanity by contributing to a sustainable environment. Industrial Revolution 6.0 is intended to improve the quality of life with improved mutual relationships between humans and technologies. Circular economy principles are based on the creation of value from waste. The achievement of sustainable development goals (SDG 6, 11, 12 and 14) is not possible without an efficient waste management system. The present study discusses the technologies that help to collect, segregate, process, recycle and generate value by a cost-effective waste management system. The impact of the study is to identify the policy gaps and challenges in the waste management system and the promotion of green technologies to boost the investment in innovation for waste management.

AI-Powered User Experience Personalization In Saas Platforms

Arpit Jain (Koneru Lakshamaiah Education Foundation)*; Karthik Venkatesan (New York University,); Shashank Shekhar Katyayan (Michigan State University); Rahul Kumar (Amity University)

In the competitive landscape of Software as a Service (SaaS) platforms, delivering a personalized user experience has become a critical factor in increasing user satisfaction, engagement, and retention. With the rapid evolution of artificial intelligence (AI), SaaS platforms now have the opportunity to leverage AI-powered solutions to optimize user experience (UX) by tailoring interfaces, content, and functionality to the unique needs of individual users.

Lifecycle Management of Data Centers Through Predictive Analytics

Arpit Jain (Koneru Lakshamaiah Education Foundation)*; Sushira Somavarapu (Louisiana State University); Padmini Rajendra (sInstitute of Chartered Accountants of India); Ashok Kumar (Amity University)

The increasing demand for data centers due to digital transformation, big data, and the growth of cloud services has made it essential to optimize their operations and ensure long-term sustainability. The complexity of managing data centers, with their vast array of servers, cooling systems, power supplies, and storage devices, presents challenges in both operational efficiency and cost-effectiveness. Traditional approaches to data center management rely heavily on manual monitoring and reactive maintenance, leading to inefficiencies and unplanned downtimes. This research explores the integration of predictive analytics in lifecycle management of data centers, proposing a framework to enhance their efficiency, reliability, and overall performance.

Strategies for Continuous Service Improvement in IT Operations

Lucky Jha (ABESIT)*; Srikanthudu Avancha (Bharathidasan University Palkalaiperur); Nalini Nadarajah (California State University); Prof. (Dr) Punit Goel (Maharaja Agrasen Himalayan)

Continuous Service Improvement (CSI) in IT operations is a crucial practice for ensuring the consistent enhancement of services, processes, and customer experiences. This process involves the ongoing evaluation and refinement of IT services to align with evolving business objectives and technological advancements.

Streamlining Data-Driven Insights with SAP Analytics Cloud

Arpit Jain (Koneru Lakshamaiah Education Foundation)*; Rafa Abdul (Bradley University); Rajesh Ojha (Rajiv Gandhi Proudyogiki Vishwavidyalaya); Nagender Yadav (CCS University)

In the era of digital transformation, businesses across various sectors are leveraging advanced analytics platforms to derive actionable insights from data. SAP Analytics Cloud (SAC) has emerged as a powerful tool for organizations seeking to streamline their data-driven decision-making processes. This research paper explores the potential of SAP Analytics Cloud in enhancing the efficiency of data analysis and improving the decision-making landscape for enterprises.

Optimizing Data Extraction Techniques with Talend and DataStage

Akshit kohli (ABESIT college of Engineering)*; Saketh Reddy Cheruku (Wichita State University); Swathi Garudasu (Symbiosis Center for Distance Learning)

In modern enterprises, effective data extraction is a fundamental requirement for generating actionable insights to drive business decisions. ETL tools like Talend and IBM DataStage have gained the status of indispensable elements in handling complex data integration tasks. This study evaluates parallel processing, metadata-driven extraction, and real-time data integration for improved performance. Further, the comparative analysis points out the strong points of Talend in its open-source flexibility and DataStage in enterprise-grade scalability. The case studies and performance benchmarks from this research depict substantial reductions in extraction time and resource consumption. These insights shall

help data engineers and architects in designing optimized ETL pipelines to ensure robust and scalable data solutions for business intelligence and analytics platforms.

AI-Powered Automation in Oracle ERP Procurement Systems

Arpit Jain (Koneru Lakshamaiah Education Foundation)*; Vaidheyar Raman Balasubramanian (SASTRA Deemed University); Vanitha Sivasankaran Balasubramaniam (Georgia State University); Sandeep Kumar (Sr)

AI-powered automation in procurement systems has emerged as a transformative force in streamlining and optimizing supply chain management. Oracle ERP, with its integrated suite of applications, offers a robust framework for implementing AI-powered automation in procurement processes, driving efficiency, accuracy, and cost savings across organizations. This research paper explores the key aspects of integrating artificial intelligence into Oracle ERP's procurement systems and the benefits it brings to modern enterprises.

Renewable Energy Solutions in Power Electronics

Punit Goel (GEU)*; Ramya Ramachandran (University of Iowa); Praveen Kumar Ilamurugan (Pondicherry University); Shilpa Choudhary (Neil Gogte Institute of Technology)

The rapid advancement of renewable energy technologies has brought forth new challenges and opportunities in power electronics. As the global demand for clean energy increases, the need for efficient, reliable, and scalable power electronics solutions has become paramount. Renewable energy systems, such as solar, wind, and hydropower, often require specialized power electronics to efficiently convert, store, and manage the generated energy. These systems, while promising in terms of environmental benefits, present unique demands in terms of power conversion efficiency, energy storage, and integration with the existing grid infrastructure.

AI Integration in Smart Manufacturing Systems

Punit Goel (GEU)*; Abhinav Raghav (IILM University); Jayanth Kolli (Northern Illinois University); Karthikeyan Ramdass (Anna University)

The rise of Industry 4.0 has ushered in a transformative phase in manufacturing, where digital technologies, automation, and artificial intelligence (AI) converge to optimize production systems. AI integration in smart manufacturing systems is at the forefront of this revolution, providing enhanced capabilities for predictive maintenance, quality control, process optimization, and decision-making. This paper explores the various facets of AI integration into smart manufacturing, examining its implications for operational efficiency, product quality, and workforce management.

Real-Time Data Processing Pipelines in Low Latency Systems

Punit Goel (GEU)*; Nandish Shivaprasad (Missouri University of Science and Technology); Arun Mulka (Kakatiya University); Lalita Verma (IILM University)

In the era of data-driven decision-making, real-time data processing has become a critical component for a variety of applications, ranging from financial services to IoT systems. Low latency is often a top priority in these systems, as the ability to process and act on data with minimal delay can significantly enhance operational efficiency, improve customer experiences, and provide competitive advantages. This paper explores the design, implementation, and optimization of real-time data processing pipelines in low-latency systems, focusing on techniques that reduce processing time, improve system responsiveness, and ensure scalability in complex, distributed environments.

Agile Methodologies in iOS and Android Development: A Comparative Study

lucky jha (ABESIT)*; Dheeraj Yadav (Maharshi Dayanand University Rohtak); Siddharth Choudhary Rajesh (NYU, New York); Prof. (Dr.) Arpit Jain (KL University)

Agile methodologies have become a cornerstone in modern software development, particularly in mobile application development for iOS and Android platforms. This comparative study explores the application and effectiveness of Agile practices in both iOS and Android development environments.

Multi-Cloud Deployment Strategies for Enterprise Databases

Punit Goel (GEU)*; Ashish Kumar (Tufts University); Indra Reddy Mallela (Texas Tech University); Dr. Gaurav Raj (Sharda University)

In recent years, multi-cloud deployment strategies have gained significant attention due to their potential to enhance flexibility, reduce risks, and optimize performance in enterprise database management. By leveraging multiple cloud service providers (CSPs), organizations can avoid vendor lock-in, increase redundancy, and meet regulatory compliance requirements while optimizing costs. This paper explores the multi-cloud deployment strategies specifically tailored for enterprise databases, outlining key advantages, challenges, and best practices for their effective implementation.

Enhancing Mobile App Performance with AI-Driven Optimization Techniques

Lucky Jha (ABESIT)*; Kumaresan Durvas (Bharathidasan University); Swethasri Kavuri (Stony Brook University); Dr. Lalit Kumar (IILM University)

The increasing demand for high-performance mobile applications has highlighted the need for effective optimization techniques to ensure seamless user experiences. As mobile devices continue to evolve in terms of processing power and capabilities, mobile applications must also adapt to these advancements.

Serverless Architectures for Scalable SaaS Applications

Punit Goel (GEU)*; Akshay Gaikwad (Rochester Institute of Technology); Rajas Paresh Kshirsagar (New York University); Aditya Dayal Tyagi (Sharda University)

Serverless architectures have gained significant traction as a transformative solution for developing and deploying scalable Software as a Service (SaaS) applications. These architectures, often referred to as Function-as-a-Service (FaaS), represent a paradigm shift away from traditional infrastructure management, enabling developers to focus solely on writing code rather than managing servers or allocating resources. This paper explores the benefits, challenges, and implementation strategies of adopting serverless architectures for SaaS applications, particularly in the context of scalability, performance, and cost efficiency.

AI-Driven Client Relationship Management in Project Management

Lucky Jha (ABESIT)*; Siddhey Mahadik (Northeastern University); Archit Joshi (Maharshi Dayanand University); Reeta Mishra (IILM University)

In recent years, Artificial Intelligence (AI) has revolutionized various industries, including project management, by enhancing the effectiveness and efficiency of Client Relationship Management (CRM) systems. AI-driven CRM platforms provide significant improvements in the management and optimization of client interactions, helping project managers and teams deliver personalized, timely, and proactive service.

Leveraging Cloud-Based ETL for Real-Time Data Processing

Akshit kohli (ABESIT college of Engineering)*; Rajkumar Kyadasu (Rivier University); Sugeetha Avvaru (Anna University); Dr. Pooja Sharma (IIMT University)

The demand for real-time data processing in today's digital landscape has made organizations move to more efficient, scalable, and flexible solutions. ETL in the cloud helps to process streams of data in real time while seamlessly integrating with distributed data sources and providing powerful processing capabilities. This paper attempts to explore how cloud-based ETL can be an enabler in processing data in real time, looking at some advantages of scalability, cost-effectiveness, and high availability.

Transforming Service Delivery Models Through Digital Transformation

Lucky Jha (ABESIT)*; Nalini Nadarajah (California State University); Soham Sunil Kulkarni (University Of California); Prof. (Dr) MSR Prasad (Koneru Lakshmaiah Education)

The rapid evolution of digital technologies has significantly impacted service delivery models across industries, driving the need for organizations to adapt and innovate. "Transforming Service Delivery Models through Digital Transformation" explores the pivotal role of digitalization in reshaping how businesses deliver services to their customers.

Optimizing Battery Performance Using Advanced Machine Learning Models

Punit Goel (GEU)*; Saurabh Ashwinikumar Dave (Saurashtra University); Dinesh Nayak Banoth (Cleveland State University)

As the demand for efficient energy storage solutions continues to grow, optimizing battery performance has become a critical aspect of various industries, including electric vehicles (EVs), renewable energy systems, and portable electronics. Traditional methods of improving battery efficiency primarily focus on physical and chemical modifications to battery materials, which, while effective, often face limitations in scalability, cost, and environmental impact.

Advanced Data Integration Techniques Using Tableau

Akshit kohli (ABESIT college of Engineering)*; Ravi Kiran Pagidi (Jawaharlal Nehru Technological University); Smita Raghavendra Bhat (University of Southern California); Er. Aman Shrivastav (ABESIT Engineering College)

Data integration is such an important process in this data-driven world, where businesses and organizations rely on multiple sources of data to derive insights and make effective decisions. The findings here are targeted to close the gap between data science and business intelligence by providing actionable insights on how to enhance data integration processes with Tableau for practitioners.

Automation in Salesforce CRM Customization for Business Growth

Akshit kohli (ABESIT college of Engineering)*; Abhishek Tangudu (Campbellsville University); Prabhakaran Rajendran (Anna University); Shalu Jain (Maharaja Agrasen Himalayan Garhwal University)

In today's fast-moving business landscape, organizations are always looking for ways to optimize customer relationships and increase operational efficiency. As the world's top Customer Relationship Management (CRM) platform, Salesforce has strong sales, service, and marketing operations management capabilities. However, manual configuration and customization of Salesforce for specific business needs can be resource-intensive.

Threat Modeling in Agile SDLC: A Modern Approach

Lucky Jha (ABESIT)*; Bipin Gajbhiye (Johns Hopkins University); Guruprasad Govindappa (BMS College of Engineering); Akshun Chhapola (Delhi Technical University)

Threat modeling is an essential practice in the software development lifecycle (SDLC), particularly in the context of agile methodologies, where development teams prioritize flexibility, iterative progress, and rapid deployment. In traditional SDLC models, threat modeling is often conducted in a rigid, linear sequence, which can delay project timelines and hinder the ability to respond swiftly to evolving security risks.

AI-Driven Enhancements in Salesforce Customer Relationship Models

Akshit kohli (ABESIT college of Engineering)*; Prince Tyagi (Dr. A.P.J. Abdul Kalam Technical University); Sunny Jaiswal (Western Governor University); Er. Priyanshi Kumari (IIIT Guwahati)

With the infusion of Artificial Intelligence into its very core, Salesforce has changed CRM models by increasing efficiency, accuracy, and customer engagement. AI-driven capabilities in predictive analytics, sentiment analysis, and process automation mean businesses can now anticipate their customers' needs, personalize interactions, and improve decision-making.

Enhancing Cybersecurity with AI-Powered Penetration Testing Tools

Lucky Jha (ABESIT)*; Venkata Reddy Thummala (Visvesvaraya Technological University); Ankit Kumar Gupta (Uttar Pradesh Technical University); Er. Siddharth Kumar (Bennett University)

The increasing sophistication of cyber threats necessitates the development of more advanced and efficient cybersecurity measures. Traditional penetration testing (pen testing) methods, while valuable, often struggle to keep pace with the rapidly evolving threat landscape.

Improving Business Outcomes Through Salesforce Einstein Analytics

Akshit kohli (ABESIT college of Engineering)*; Priyank Mohan (Seattle University); Shyamakrishna Siddharth Chamarthy (Columbia University); Er. Siddharth Kumar (Bennett University)

In today's data-driven business environment, the ability to make informed, strategic decisions is a key determinant of success. Salesforce Einstein Analytics, an advanced AI-powered analytics platform, provides enterprises with robust tools for enhanced decision-making and operational efficiency.

Automating Secure Software Development Life Cycle Processes

Lucky Jha (ABESIT)*; Sunil Sudhakaran (Mahatma Gandhi University Kottayam); Sreeprasad Govindankutty (Rochester Institute of Technology Rochester); Dr S P Singh (Gurukul Kangri University)

The increasing complexity of modern software systems, combined with the need for rapid development cycles, has highlighted the importance of automating the Software Development Life Cycle (SDLC). Automating SDLC processes, particularly with a focus on security, can improve both the efficiency and security posture of software projects.

Fault Tolerance in Distributed Storage Systems

Akshit kohli (ABESIT college of Engineering)*; Balachandar Paulraj (Anna University); Vignesh Natarajan (Arizona State University Tempe); Dr. Neeraj Saxena (MIT colleges of Management Moradabad)

Fault tolerance is a critical design consideration in distributed storage systems, ensuring data availability and reliability despite hardware or software failures. As modern applications demand high scalability and performance, distributed storage systems must be resilient to various types of faults, such as node crashes, network partitions, and disk failures.

Data Migration Challenges in S4 HANA Implementations

Niharika Singh (ABES Engineering College)*; Digneshkumar Khatri (Gujarat University); Sirish Kumar Narra (Osmania University); Dr. Saurabh Solanki (Aviktechnosoft Private Limited)

Upgrading to SAP S/4HANA is the process through which a company will update its ERP systems in addition to the new features of real-time data analysis, simpler data structures, and user-friendly experiences. The process of data migration, however, proves to be highly challenging, which affects the outcome of the implementation.

Leveraging Machine Learning for Financial Forecasting in SAP FICO

Niharika Singh (ABES Engineering College)*; Rajesh Tirupathi (Liverpool John Moores University); Abhijeet Bhardwaj (Maharishi Dayanand University)

Financial forecasting is the foundation of business decision-making and long-term strategic planning for businesses. The rapidly increasing complexity in the financials has forced even the conventional methods of forecasting to be ineffective in giving reliable predictions of the financial trends.

Real-Time Analytics in Big Data Processing Using Apache Kafka

OM Goel (ABES)*; Akash Balaji Mali (State University of New York at Binghamton); Pramod Kumar Voola (Osmania University Hyderabad); Dr. Shruti Saxena (Savitribai Phule Pune University Pune)

Real-time analytics in big data processing has become a critical aspect of modern enterprises, enabling timely insights and rapid decision-making. Apache Kafka, a distributed event streaming platform, has emerged as a leading technology for building scalable and fault-tolerant real-time data pipelines.

Integrating AI for Real-Time Financial Data Reconciliation in ERP Systems

Niharika Singh (ABES Engineering College)*; Vardhansinh Yogendrasinnh Ravalji (Northeastern University); VIjayanand Balasubramaniam (Bharathiar University); Prof. (Dr) MSR Prasad (Koneru Lakshmaiah Education)

Artificial Intelligence (AI) in ERP has revolutionized the management of financial data especially concerning the reconciliation of data in real time. This research explores the challenges and benefits of AI implementation in ERP systems, such as data integration complexities, scalability of AI models, and user acceptance. The results show that AI-driven financial data reconciliation can drastically transform corporate finance processes in terms of precision, responsiveness, and oversight in dynamic financial contexts.

Reinforcement Learning for Multi-Agent Systems in Complex Networks

OM Goel (ABES)*; Murali Mohana Krishna Dandu (University of California San Diego San Diego); Aatishkumar Dhami (California State University Long Beach Long Beach); Vikhyat Gupta (Chandigarh University, Punjab)

Reinforcement learning has become a potent tool for decision-making problems in complex and dynamic environments. Applied to MAS, which interact in complex networks, it has significant potential to help solve some real-life problems resulting from domains such as communication networks, smart grids, and traffic management.

Cloud-Native Testing Approaches for Performance Assurance

Niharika Singh (ABES Engineering College)*; Balaji Govindarajan (University Of Madras); Suket Gakhar (Kurukshetra University); Dr. Ravinder Kumar (DSNN Govt. (PG) College)

Cloud-native architectures fundamentally changed the way applications are designed, deployed, and scaled in response to dynamic and distributed attributes. In this regard, it brings along a critical challenge: reliability and scalability of performance. The adoption of a holistic cloud-native testing framework will enable organizations to effectively address performance bottlenecks, enhance resilience, and ensure an optimal user experience in highly elastic cloud environments.

Large Language Models for E-Commerce Product Recommendations

OM Goel (ABES)*; Krishna Kishor Tirupati (International Institute of Information Technology); Abhijeet Bajaj (Columbia University); Niharika Singh (ABES Engineering College)

Large Language Models (LLMs) have become revolutionary tools in the e-commerce landscape, specifically in improving recommendations for products. Unlike the traditional recommendation systems that rely on user-item interaction matrices or collaborative filtering, LLMs mine vast amounts of unstructured data, such as product descriptions, user reviews, and behavioral insights, to generate highly contextual and personalized suggestions.

Automating Big Data Testing Pipelines Using CI/CD Tools

Niharika Singh (ABES Engineering College)*; Venkatadri Marella (International Technological University); Arulselvan Janakiraman (Anna University)

The rapid proliferation of big data has posed an imperative challenge to assurance of reliability and accuracy. Traditional testing approaches are frequently found to be insufficient in the face of vast scale, complexity, and the dynamics of big data workflows.

AI-Powered Signal Processing Techniques in 5G Networks

OM Goel (ABES)*; Sachin Bhatt (Rajiv Gandhi Technology University Bhopal); Rohan Viswanatha Prasad (Visvesvaraya Technological University Machhe, Belagavi); Daksha Borada (IILM University)

The advent of 5G networks has revolutionized telecommunications, offering unprecedented speed, ultra-low latency, and massive connectivity. However, realizing these capabilities requires sophisticated signal processing to overcome complex channel conditions, interference, and hardware impairments.

Challenges in Ensuring Quality in Distributed Cloud Environments

Niharika Singh (ABES Engineering College)*; Satish Krishnamurthy (Anna university); Srinivasan Jayaraman (Maharishi International University); Deependra Rastogi (IILM University)

The rapid growth of distributed cloud environments has brought unprecedented levels of scalability, flexibility, and performance to modern computing systems. However, ensuring consistent quality across these distributed infrastructures is a challenge. This complexity arises from the decentralized nature of cloud resources, the heterogeneity of the infrastructure, dynamic workload allocation, and the different SLAs established by different providers. Primary concerns include latency control, data consistency, fault tolerance, and the seamless orchestration of services. The multi-cloud and hybrid environments bring forth added intricacies in security, compliance, and continuous monitoring. To solve these issues, the use of robust quality assurance frameworks with the support of advanced automation, AI-based monitoring, and predictive analytics are necessary. The abstract discusses an overview of some of the challenges associated with ensuring quality in distributed cloud systems by focusing on new approaches for reliability and performance of services.

Energy-Efficient Communication Protocols for IoT Devices

OM Goel (ABES)*; Mahaveer Siddagoni Bikshapathi (The University of Texas at Tyler); Sandhyarani Ganipaneni (JNTU University); Shubham Jain (IIT Bombay)

The Internet of Things (IoT) devices are creating unprecedented opportunities in many fields, including healthcare, smart cities, and industrial automation. The critical challenge faced by IoT devices is energy consumption, as most of them are resource-constrained. Energy-efficient communication protocols can be used to extend the life span of devices and make their operation sustainable.

Enhanced VLSI Design Strategies for Telecommunications Systems

OM Goel (ABES)*; Ashvini Byri (Visvesvaraiah Technological University VTU Belgaum); Narrain Prithvi Dharuman (National Institute of Technology Trichy)

The fast-moving telecommunications industry is driving the demand for Very Large Scale Integration (VLSI) design approaches that can achieve higher performance at lower power consumption and higher reliability. This paper demonstrates, through simulation results and case studies, that the proposed VLSI strategies can improve system performance significantly while maintaining power efficiency and low cost. The findings contribute to the ongoing research and development in VLSI

technology and offer a roadmap for designing next-generation telecommunications systems capable of supporting emerging applications such as 5G, IoT, and beyond. These strategies not only enhance the robustness of the design but also open the way toward more scalable and adaptive telecommunications infrastructures.

Snowflake vs. SAP BW: A Comparative Study for Data Analytics

OM Goel (ABES)*; Piyush Bipinkumar Desai (Vellore Institute of Technology Vellore, Tamil Nadu); Khushmeet Singh (Dr. A.P.J. Abdul Kalam Technical University Lucknow); Nagender Yadav (CCS University Meerut)

The modern data environment demands strong solutions for managing, storing, and analyzing large amounts of data efficiently. The findings underscore the growing importance of cloud-native solutions like Snowflake, while acknowledging SAP BW's role in legacy systems transformation.

The Impact on System Performance of Combining Heat Pumps with Seasonal Thermal Energy Storage (STES) in Cold Regions with High Heating Demands

Panchapakesan N (Arsmtrong International)*

System Performance and operational efficiency get enhanced with the combination of heat pump with Seasonal Thermal Energy Storage (STES) especially in cold regions with high heating demands. This approach not only improves the coefficient of performance (COP) of heat pumps but also contributes to load management and grid stability. The practical benefits of integrating heat pumps with STES extend beyond energy efficiency include minimizing the carbon emissions, enhanced resilience and sustainability. The main aim of the study is to examine the impact on system performance of combining heat pumps with seasonal thermal energy storage in cold regions with high heating demands.

Business Intelligence Dashboards for Strategic Decision-Making

Raghav Agarwal (MIET Meerut)*; Balachandar Ramalingam (Pondicherry University,); Krishna Prasath Sivaraj (The University of Toledo); Lagan Goel (AKG International)

In today's dynamic business environment, strategic decision-making becomes critical to an organization's success. Business Intelligence dashboards have emerged as strong supports for this core process of enhancing strategic decisions with real-time, data-driven insights. This abstract considers the critical role of BI dashboards in facilitating informed decision-making processes across various organizational levels.

Predictive Analytics for Market Trends Using Big Data

Raghav Agarwal (MIET Meerut)*; Vybhav Reddy Kammireddy (Bowling Green State University); Dr. Shruti Saxena (Savitribai Phule Pune University Pune, India pune,); Shachi Ghanshyam Sayata (Illinois Institute of Technology Chicago)

Predictive analytics is one of the most integral parts of modern business intelligence, and it has leveraged the power of big data to change decision-making processes altogether. The ever-growing volume, variety, and velocity of data generated by industries have bestowed organizations with ample opportunity to forecast future market trends with accuracy. This paper explores the application of predictive analytics in finding emerging patterns and market dynamics using advanced techniques of big data

Ethical Implications of Using Generative AI in Creative Domains

Raghav Agarwal (MIET Meerut)*; Jay Bhatt, (Northeastern University Boston, MA); Rahul Jain (Texas A&M University College Station); Shantanu Bindewari (IILM University Greater Noida)

The rapid proliferation of generative AI technologies has revolutionized creative domains, including art, music, literature, and design. While these technologies present immense potential for innovation, they also raise complex ethical concerns. This paper explores the ethical implications of employing generative AI in creative fields, focusing on issues such as intellectual property rights, authenticity, societal impact, and the evolving role of human creativity.

Optimizing Face Alignment: Storage-Efficient Regression Methods with Enhanced Processing Speed

Prasanth Kumar Chevva (Ovkay)*

This research investigates novel regression-based methods for face alignment, focusing on optimizing storage requirements and processing speed in the context of the 300W dataset. We analyze the effects of random initializations on alignment accuracy and demonstrate how averaging results can enhance the stability of video processing. Through parameter quantization, we achieve significant memory savings while main- taining accuracy, reducing storage requirements by approxi- mately 21 times. Our proposed methods, particularly the Random Regression Regression (RRR) approach, outperform traditional techniques and demonstrate competitive results compared to recent deep-learning models, offering a compelling accuracy-to- speed tradeoff. These findings suggest that our techniques are well-suited for deployment on mobile devices and embedded hardware, making them a viable solution for real-time face alignment applications.

Lightweight Deep Learning for Knee Osteoarthritis Analysis: A MobileNet Perspective

Suman Rani (Uttaranchal University)*

Most people globally suffer from osteoarthritis of the knees. It is a common degenerative joint disorder that requires early identification and precise grading to inform effective therapy plans. A frequent aspect of traditional medical procedures has manual radiography analysis, which is laborious and prone to errors. This paper offers a portable and effective deep learning-based method for KOA the identification and assessment that makes use of MobileNet. MobileNet, a type of convolutional neural network specifically intended for mobile or embedded devices, is used to computationally effectively extract discriminative features from knee radiographs. The proposed model was tested and trained

using a publicly available OAI dataset, exhibiting competitive accuracy in KOA classification as well as adaptability and severity evaluation.

Advancements in Large-Scale Language Models for Personalization

Raghav Agarwal (MIET Meerut)*; Varun Garg (University of California San Diego); Bhageerath Bogi (University of Florida Gainesville); Pushpa Singh (IILM University Greater Noida)

The rapid evolution of large-scale language models has transformed the field of personalization, bringing unprecedented capabilities to understand and predict user preferences. Large datasets and complex architectures make it possible to deliver highly personalized experiences across various domains, such as e-commerce, healthcare, education, and entertainment. Some of the important advancements in this regard include novel pre-training techniques, fine-tuning strategies, and prompt engineering that enable LLMs to provide contextualized real-time personalization.

Explainable AI in Deep Learning Applications

Raghav Agarwal (MIET Meerut)*; Ravi Mandliya (Clemson University Clemson, SC 29634, United States); Anant Kumar (Manipal University Manipal, Karnataka, India); Dr. Shakeb Khan (Maharaja Agrasen Himalayan Garhwal University Uttarakhand)

Explainable Artificial Intelligence (XAI) is an emerging field that seeks to enhance transparency and interpretability in AI systems, particularly deep learning models that are often regarded as "black boxes." While achieving state-of-the-art performance in a variety of applications, including image recognition, natural language processing, and medical diagnostics, deep learning models are notoriously difficult to understand because of their complex architectures and high-dimensional feature spaces. The lack of interpretability poses challenges for trust, ethical deployment, regulatory compliance, and decision-making in critical domains.

Zero Trust Architectures for Enhanced Enterprise Security

Raghav Agarwal (MIET Meerut)*; Srinivasulu Harshavardhan Kendyala (University of Illinois Springfield Springfield, Illinois kendyalah@gmail.com); Saikumar s Chalivendra (University of Dayton OH 45469, United State); Shantanu Bindewari (IILM University Greater Noida, India)

Zero Trust Architecture is the new paradigm of enterprise security. This challenges the perimeter-based defense strategy. The older models, where trust was vested in the user or the device within the network boundary, are failing in an era where cloud computing is rapidly being adopted and remote work environments and mobile devices are gaining ground. Zero Trust works on the philosophy of "never trust, always verify," whereby every access request must be continually authenticated, authorized, and validated by dynamic policies before access is allowed to any resource. Such a methodology uses a series of critical technologies and procedures, like MFA, IAM, micro-segmentation, and continuous monitoring of user activity and device integrity.

Machine Learning Models for Identity and Access Management

Raghav Agarwal (MIET Meerut)*; Sivaprasad Nadukuru (Andhra University Visakhapatnam, Andhra Pradesh)

In the realm of modern enterprises, robust Identity and Access Management (IAM) systems are critical for ensuring secure access to sensitive information and preventing unauthorized access. Traditional rule-based IAM approaches, while effective to an extent, often suffer from scalability limitations and a lack of adaptability to dynamic threat landscapes. Machine Learning (ML) models have emerged as powerful tools to enhance the capabilities of IAM systems by enabling intelligent, data-driven decision-making. This paper explores the application of various ML techniques in IAM, such as anomaly detection, user behavior analytics, and role-based access optimization.

Blockchain-Based Approaches to Secure Cloud Data

Raghav Agarwal (MIET Meerut)*; Nanda Kishore Gannamneni (Nagarjuna University Guntur, Andhra Pradesh); Sanyasi Sarat Satya Sukumar Bisetty (Madras University Chennai, Tamil Nadu)

Cloud computing services are adopted rapidly worldwide across industries, which raises significant concerns about data privacy, integrity, and security. Traditional cryptographic techniques and access control mechanisms have been proposed and implemented to deal with such challenges; however, they still suffer from inherent vulnerabilities such as centralized trust and single points of failure. In this context, blockchain technology emerges as a most promising enabler for enhancing cloud data security due to its decentralized and tamper-resistant characteristics. This paper presents an in-depth review of the blockchain-based approaches for cloud data security using distributed ledger technologies.

Stock Market Closing Prediction

Rashmi Sharma (Symbiosis International University)*; Anisha Jaiswal (Symbiosis International (Deemed University)); Akanksha Gangwani (Symbiosis International (Deemed University)); Manmeet Oberoi (Symbiosis International (Deemed University)); Monali Gulhane (Symbiosis International University); Parul Dubey (Symbiosis International University)

This work is on using machine learning to forecast the closing prices of stocks. To do this, we used the Yahoo Finance (yfinance) API can retrieve historical market data where we extracted daily stock parameters like Open, High, Low, Close, Volume. However, for improved predictive capability, several technical variables including Moving Average (MA), Relative Strength Index (RSI), and Moving Average Convergence Divergence (MACD) were integrated. It includes data pre-processing, feature extraction, feature scaling and data feature selection along with model selection. Other methods such as LSTM or ARIMA model and Random forest were employed to study the characteristics and forecast the values of stock prices. The model performance was assessed by using Root Mean Squared Error (RMSE), Mean Absolute Error (MAE) and R-squared values. The findings also demonstrate usefulness of the ML algorithms in financial forecasting as a strong grounding for making the right decision in stock trading.

Blockchain-Based Approaches to Secure Cloud Data

Raghav Agarwal (MIET Meerut)*; Nanda Kishore Gannamneni (Nagarjuna University Guntur, Andhra Pradesh); Sanyasi Sarat Satya Sukumar Bisetty (Madras University Chennai, Tamil Nadu)

Cloud computing services are adopted rapidly worldwide across industries, which raises significant concerns about data privacy, integrity, and security. Traditional cryptographic techniques and access control mechanisms have been proposed and implemented to deal with such challenges; however, they still suffer from inherent vulnerabilities such as centralized trust and single points of failure. In this context, blockchain technology emerges as a most promising enabler for enhancing cloud data security due to its decentralized and tamper-resistant characteristics. This paper presents an in-depth review of the blockchain-based approaches for cloud data security using distributed ledger technologies

Stock Market Closing Prediction

Rashmi Sharma (Symbiosis International University)*; Anisha Jaiswal (Symbiosis International (Deemed University)); Akanksha Gangwani (Symbiosis International (Deemed University)); Manmeet Oberoi (Symbiosis International (Deemed University)); Monali Gulhane (Symbiosis International University); Parul Dubey (Symbiosis International University)

This work is on using machine learning to forecast the closing prices of stocks. To do this, we used the Yahoo Finance (yfinance) API can retrieve historical market data where we extracted daily stock parameters like Open, High, Low, Close, Volume. However, for improved predictive capability, several technical variables including Moving Average (MA), Relative Strength Index (RSI), and Moving Average Convergence Divergence (MACD) were integrated. It includes data pre-processing, feature extraction, feature scaling and data feature selection along with model selection. Other methods such as LSTM or ARIMA model and Random forest were employed to study the characteristics and forecast the values of stock prices. The model performance was assessed by using Root Mean Squared Error (RMSE), Mean Absolute Error (MAE) and R-squared values. The findings also demonstrate usefulness of the ML algorithms in financial forecasting as a strong grounding for making the right decision in stock trading.

The Impact of Music Genres on Study Efficiency: Analyzing Distraction through Eye and Facial Movement Tracking through Biometrics

Reetu Jain (On My Own Technology)*; Mitali Rao (school)

The impact of music on cognitive execution has been broadly talked about, with changing comes about in existing writing. Some studies claim it enhances concentration while others argue that it'd distract. While this debate continues, the study intends to resolve the common discrepancies by exploring how different music genres affect study performance. An array of modern biometric devices including eye-tracking, facial expression analysis, and, perhaps most frequently, heart rate variability (HRV) provides objective real-time insights into how music itself affects concentration. This study goes beyond self-reported data using heart rat telemetry for a more accurate examination of cognitive responsiveness to sound stimuli while study sessions are conducted.

Development of a Deep Learning-Based Algorithm for Automated Detection and Classification of Dog Skin Diseases

Reetu Jain (On My Own Technology)*

The diagnosis and treatment of dog skin diseases, including fungal infections, bacterial dermatosis, and hypersensitivity dermatitis, are critical challenges in veterinary dermatology. Diagnosis through traditional methods is a tedious and somewhat subjective process, enabling the risk of human error and consequent delay in treating the actual cause. This paper proposes a deep learning approach that utilizes Convolutional Neural Networks (CNNs) for the automated detection and classification of dog skin diseases into four categories: fungal infections, bacterial dermatosis, hypersensitivity dermatitis, and healthy skin. The methodology utilizes a labeled data set of high-resolution images to train and validate the model. Data augmentation methods, including rotation, scaling, and flipping, are implemented to further improve the model generalization.

Designing a Web App Using ChatGPT API to Support the Visually Impaired: Efficient Image-to-Text and Document Transcription through AI

Reetu Jain (On My Own Technology)*; Naman Kheterpal Naman Kheterpal (School)

This paper presents the design and development of a web application utilizing the ChatGPT API to support visually impaired users by providing efficient image-to-text and document transcription capabilities. The app addresses the accessibility challenges that visually impaired individuals face when accessing books, research papers, web articles, and images. Traditionally, the process of converting written content into accessible formats for the visually impaired, such as audio or braille, is laborious and time-consuming, often taking days or months. By leveraging AI, specifically the ChatGPT API, the proposed web app significantly reduces this conversion time while improving accuracy and usability.
The app is structured into three main sections: books, research papers and web articles, and images.

Real-Time Analytics in Big Data Processing Using Apache Kafka

Akshit kohli (ABESIT college of Engineering)*; Akash Balaji Mali (State University of New York); Pramod Kumar Voola (Osmania University); Dr. Shruti Saxena (Savitribai Phule Pune University Pune, India)

Real-time analytics in big data processing has become a critical aspect of modern enterprises, enabling timely insights and rapid decision-making. Apache Kafka, a distributed event streaming platform, has emerged as a leading technology for building scalable and fault-tolerant real-time data pipelines. This paper explores the integration of Apache Kafka in real-time analytics workflows, focusing on its core components, including producers, consumers, brokers, and topics. Kafka's publish-subscribe messaging model and stream processing capabilities provide a robust framework for ingesting, storing, and processing large volumes of real-time data with minimal latency.

Scalable Architectures for Distributed Cloud-Based Databases

Punit Goel (GEU)*; Hrishikesh Rajesh Mane (The State University of New York at Binghamton); Rakesh Jena (Biju Patnaik University of Technology Rourkela, Odisha); Om Goel, (ABES Engineering College Ghaziabad)

The rapid growth of data-intensive applications has led to an increasing demand for scalable, distributed cloud-based databases capable of ensuring high availability, fault tolerance, and efficient data management. Scalable architectures in this domain are essential for meeting diverse workload requirements while maintaining optimal performance and cost-efficiency.

Natural Language Processing for Enterprise-Level Data Summarization

Punit Goel (GEU)*; Antony Satya Vivek Vardhan Akisetty (Southern New Hampshire University); Hari Gupta (University of Southern California); Raghav Agarwal (TCS Bengaluru)

NLP has been called a transformational technology for data summarization at an enterprise scale, enabling enterprises to make better decisions from vast reams of unstructured data. Enterprises generate a lot of data in various forms: customer reviews, emails, reports, and transaction logs. The traditional ways of analyzing these datas are mostly manual, which are not only time-consuming but also fail to capture the true meaning hidden in the text information.

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