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## Department of **Computer Science and Engineering (AI & ML)** Presents

2<sup>nd</sup> Online/Offline Mega International Conference on "Innovations and Emerging Trends in Artificial Intelligence and Machine Learning Applications" on 17<sup>th</sup> & 18<sup>th</sup> December 2024



(ICIETAIML - 24) **PROCEEDINGS**

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## **Department of Computer Science and Engineering (AI&ML)**

**2<sup>nd</sup> "International Conference on innovations and Emerging Trends in Artificial Intelligence  
and Machine learning Applications" [ICIETAIML- 2024]**

**Organized on 17<sup>th</sup> & 18<sup>th</sup> December, 2024**

**Patron, Program Chair &  
Editor in Chief**

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Group Director, SMEC

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**Dr. B.Venkateswara Rao**  
Professor & Head, Department of CSE(AI&ML), SMEC

**Editorial Committee**

**Mr. D. Venkatesan, Assistant Professor, CSE(AI&ML)**

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**Sri. M. LAXMAN REDDY**  
**CHAIRMAN**



## **MESSAGE**

I am extremely pleased to know that the Department of Computer Science and Engineering (AI&ML) of SMEC is organizing 2<sup>nd</sup> **"International Conference on innovations and Emerging Trends in Artificial Intelligence and Machine learning Applications"** [ICIETAIML- 2024] on 17<sup>th</sup> and 18<sup>th</sup> of December 2024. I understand that the large number of researchers has submitted their research papers for presentation in the conference and for publication. The response to this conference from all over India and Foreign countries is most encouraging. I am sure all the participants will be benefitted by their interaction with their fellow researchers and engineers which will help for their research work and subsequently to the society at large.

I wish the conference meets its objective and confident that it will be a grand success.

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*M. Laxman Reddy*  
**M.LAXMANREDDY**  
Chairman



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**Sri. G. CHANDRASEKHAR YADAV**  
**EXECUTIVE DIRECTOR**



## MESSAGE

I am pleased to state that the Department of Computer Science and Engineering (AI&ML) of SMEC is organizing 2<sup>nd</sup> "**International Conference on innovations and Emerging Trends in Artificial Intelligence and Machine learning Applications**" [ICIETAIML- 2024] organized by the Department of Computer Science and Engineering (AI&ML) on 17<sup>th</sup> and 18<sup>th</sup> of December 2024. For strengthening the "MAKE IN INDIA" concept many innovations need to be translated in to workable product. Concept to commissioning is along route. The academicians can play a major role in bringing out new products through innovations.

I am delighted to know that there are large numbers of researchers has submitted the paper on Engineering and Technology streams. I wish all the best to the participants of the conference additional insight to their subjects of interest.

I wish the organizers of the conference to have great success.

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**G. CHANDRASEKHAR YADAV**  
Executive Director





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## Dr. P. SANTOSH KUMAR PATRA GROUP DIRECTOR



I am delighted to be the Patron & Program Chair for the 2<sup>nd</sup> "International Conference on innovations and Emerging Trends in Artificial Intelligence and Machine learning Applications" [ICIETAIML- 2024] organized by the Department of Computer Science and Engineering (AI&ML) on 17<sup>th</sup> and 18<sup>th</sup> of December 2024. I have strong desire that the conference to unfold new domains of research among the Artificial Intelligence, Machine Learning, Block chain Technology, Internet of Things, Deep Learning, Data Analytics and will boost the knowledge level of many participating budding scholars throughout the world by opening a plethora of future developments in the field of Computer Science and Engineering (AI&ML).

The Conference aims to bring different ideologies under one roof and provide opportunities to exchange ideas, to establish research relations and to find many more global partners for future collaboration. About 130 research papers have been submitted to this conference, this itself is a great achievement and I wish the conference a grand success.

I appreciate the faculties, coordinators and Department Heads of Computer Science and Engineering (AI&ML) for their continuous untiring contribution in making the conference a reality.

**Dr. P. Santosh Kumar Patra**  
Group Director  
St. Martin's Engineering College



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**Dr. M SRINIVAS RAO**  
**PRINCIPAL**



## MESSAGE

Contemporary Society is technological and relies on technology for various aspects of daily life. There is no life without digital platforms, Internet, apps, codes, etc. Navigating the complexities of a technological society requires a balance between embracing innovation and addressing the challenges that come in the way. Considering the immediate needs of the technical Society, SMEC has been organizing International Conferences every year which really help a candidate in acquiring technical skills and making themselves familiar with the new inventions.

International Conferences are a Perfect Platform for enthusiastic researchers to come up with their innovative ideas, and I am delighted that SMEC is organizing the International Conference on Innovations and Emerging Trends in Artificial Intelligence and Machine Learning Applications this academic year as well to enhance the skills of desiring participants. The showcase of new ideas and the latest technological advancements through this Conference would facilitate the transfer of technology, helping participants to get updated with the latest tools and methodologies. I firmly believe that this Conference serves as the catalyst for change by bringing attention to pressing issues in different fields, encouraging discussions, fostering collaboration, and promoting initiatives that address different challenges on a global scale. It is an excellent opportunity to broaden our knowledge, establish meaningful connections, and contribute to advancing engineering research. I assure you that the commitment to excellence in education and research is reflected in this Conference, providing a unique platform for learning and growth.

Around 130 research papers were submitted to this Conference. I wish the authors a promising future and the Conference a grand success.

I appreciate the continuous efforts and dedication of the HOD of CSE(AI&ML) and faculty members for their invaluable contribution to advancing global discourse. My most profound appreciation to the organizers and coordinators for organizing a conference of such caliber.

**Dr. M. Srinivas Rao**  
Principal



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**Dr. SANJAY KUMAR SUMAN**  
**DEAN R&D**



## MESSAGE

Research, curiosity and discovery has been in existence ever since man's presence on this planet millions of years ago, civilization has been characterized by curiosity and discovery. Therefore, the curiosity to explore what will happen, how it happens, is there a better way to do it, has been the driving force behind all research efforts. During the past few decades, the engineering faculties have taken a number of initiatives to reorient the engineering machinery to play leading roles in the industrial development process.

I am delighted to acknowledge the international conference on 2<sup>nd</sup> "International Conference on innovations and Emerging Trends in Artificial Intelligence and Machine learning Applications-2024 (ICIETAIML- 2024)" on 17<sup>th</sup> and 18<sup>th</sup> of December 2024 organized by the Department of Computer Science and Engineering (AI&ML). I appreciate organizing team for showing their keen interest in organizing a successful conference to provide a platform for contributors to explore new ideas and exchange research findings among researchers.

I thank the support of all students, authors, reviewers, conference team, faculty members, and conference Convenor for making the conference a grand success.

**Best Wishes**

**Dr. Sanjay Kumar Suman**  
Dean R&D

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**Dr. S V S Rama Krishnam Raju**  
Dean Academics



## **MESSAGE**

It gives me immense pleasure to know that St. Martin's Engineering College 2<sup>nd</sup> **"International Conference on innovations and Emerging Trends in Artificial Intelligence and Machine learning Applications"** (ICIETAIML- 2024) organized by the Department of Computer Science and Engineering (AI&ML) on 17<sup>th</sup> and 18<sup>th</sup> of December 2024. I am sure that this conference will provide a forum to national and international students, academicians, researchers and industrialists to interact and involve in Research and Innovation. Such academic events benefit the students, teachers and researchers immensely and widen the horizons of their knowledge and work experience in the field of Deep Learning, Machine Learning, Data Mining Engineering and Innovation.

I sincerely appreciate the humble efforts of the Institute in providing a platform for students, academicians, researchers and industrialists to share their ideas and research outcome through the forum of this Conference.

I give my best wishes to all delegates and organizing committee to make this event a grand success.

**Best Wishes**

**Dr. S V S Rama Krishnam Raju**

Dean Academics





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**Dr. D V Sreekanth**  
Dean Administration



## MESSAGE

I am delighted to acknowledge the 2<sup>nd</sup> "International Conference on innovations and Emerging Trends in Artificial Intelligence and Machine learning Applications" (ICIETAIML- 2024) organized by the Department of Computer Science and Engineering (AI&ML) on 17<sup>th</sup> and 18<sup>th</sup> of December 2024 in St. Martin's Engineering College (SMEC), Hyderabad, India. The objective of this conference was to bring together experts from academic institutions, industries, research organizations for sharing of knowledge and experience in the recent trends and revolutionary technologies in Computer Science and engineering. The conference programme featured a wide variety of invited and contributed lectures from national and international speakers with expertise in their respective fields. The ICIETAIML -2024 has become one of the most extensive, spectacular international events hosted by St. Martin's Engineering College (SMEC), for its high-level quality and the large size of participation. Well- known international and national invited speakers addressed the audience, shared knowledge, and rich experiences on Revolutionary Technology in Computer Science and Engineering (AI&ML).

I am sure that this conference will provide a forum to national and international students, academicians, researchers and industrialists to interact and involve in Research and Innovation. Such academic events benefit the students, teachers and researchers immensely and widen the horizons of their knowledge.

**Best Wishes**

**Dr. D V Sreekanth**  
Dean Administration



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**Dr. B.Venkateswara Rao**  
Professor & HOD



### MESSAGE

The world is always poised to move towards new and progressive engineering solutions that results in cleaner, safer and sustainable products for the use of mankind. India too is emerging as a big production center for world class quality. Computer Science and Engineering (AI&ML) play a vital role in this endeavor.

The aim of the 2<sup>nd</sup> "International Conference on innovations and Emerging Trends in Artificial Intelligence and Machine learning Applications" (ICIETAIML- 2024) organized by the Department of Computer Science and Engineering (AI&ML) on 17<sup>th</sup> and 18<sup>th</sup> of December 2024, is to create a platform for academicians and researchers to exchange their innovative ideas and interact with researchers of the same field of interest. This will enable to accelerate the work to progress faster to achieve the individuals end goals, which will ultimately benefit the larger society of India.

We, the organizers of the conference are glad to note that more than 130 papers have been received for presentation during the online conference. After scrutiny by specialist 62 papers have been selected, and the authors have been informed to be there at the online platform for presentations. Steps have been taken to publish these papers with ISBN number in the Conference Proceedings and all the selected papers will be published in Scopus/UGC recognized reputed journals.

We are delighted and happy to state that the conference is moving towards a grand success with the untiring effort of the faculties of Department and Head of Computer Science and Engineering (AI & ML) of SMEC and with the blessing of the Principal and Management of SMEC.

*B.V. Rao*

**Dr. B.Venkateswara Rao**  
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Mrs. G. Priyanka, Assistant Professor, Dept. of CSE (AI & ML).



## TABLE OF CONTENTS

Sl.No.	Paper ID	Title of the Paper with Author Name	Page No.
1.	ICIETAIML-24-001	Analyzing NIFTY Indices for Investment Decision-Making: A Historical Perspective <i>Adapala Gahana Sree, Vara Prasad Reddy, Meduri Kalyan, Dr. K. Srinivas</i>	1
2.	ICIETAIML-24-002	Intelligent Predictive Maintenance System for Metro Train Air Production Unit Using Machine Learning Model <i>Talasila Bindu Sri, Racharla Princy, K N V Varsha, Mr.D.Venkatesan</i>	2
3	ICIETAIML-24-003	Exploring Speech Emotion Recognition: A Multi-Emotion Voice Dataset Analysis for Emotion Detection and Sentiment Analysis <i>Chilakalapudi Lakshmi Priya, Buddha Tanusri, Upputhala Uday Sai, P. Mahesh</i>	3
4	ICIETAIML-24-004	Predicting Short-Term Returns in Cryptocurrency Markets: A Machine Learning Approach <i>Srijjan Kumar Thummaji, Vujani Ayush Kumar, Bandamidi Vaidehi, Mrs. K. Swetha</i>	4
5	ICIETAIML-24-005	Facial Expression Recognition Dataset: A Comprehensive Resource for Emotion Analysis and AI Development <i>Koppu Gayathri, Tatha Akshitha, Oddepally Prasanth Mr. Kranthi Kumar</i>	5
6	ICIETAIML-24-006	AI based Muscle Activation Patterns in Daily Grasping Movements from EMG Data <i>Maddila Venkatasai Aditya, Shivuni Ganesh Chary, M V V S Siddhartha Reddy, Mrs.G.Priyanka</i>	6
7	ICIETAIML-24-007	Improving Eye Care with Predictive Modeling: Machine Learning Approach to Contact Lens Fitting Decision Support System <i>Sarasani Veda Reddy, Peechara Sai Mani Teja, Vallabhaneni Dhrushya Sree, Mr. K. Nagaraju</i>	7
8	ICIETAIML-24-008	Characterization of Glass Samples from Forensic Investigation: A study of Six Oxide-Defined Types <i>Syeda Adeeba Qadri, Roshni Kumari, Y Venkatasai Vaishnavi, Mr.J. Raj Karkee</i>	8
9	ICIETAIML-24-009	Predictive Modeling of Earthquake Occurrences with Feature Engineering and Machine Learning. <i>Ravuri Bhavya Neeraj, Akhila Tagella, RohanVarma Dandu, Mr. G. Sathish Kumar</i>	9
10	ICIETAIML-24-0010	Machine Learning Adopted Human Activity Classification using Shimmer Wearable Sensors for Health Monitoring <i>Birbathri Hari Priya, Gattu Abhinav, G Pranav Raj Yadav, Mr. Naveen Chakravarthi</i>	10
11	ICIETAIML-24-011	A Comprehensive Dataset for Urban Sound Classification and Analysis <i>Yeluri Harika, G Jai Shree, Govuri Tejaswini, Dr. K.Srinivas</i>	11
12	ICIETAIML-24-012	Unveiling Nature's Symphony: An Animal Sounds Dataset for Audio Analysis <i>Panuganti Rajeshwari Reddy, Illuri Dhanyata Nimmala Apoorva, Mr. S. Chandra Prakesh</i>	12
13	ICIETAIML-24-013	Harmonizing Data Science with Melody Metrics: Decoding Song Popularity Through Machine Learning. <i>Mohammed Saif Ali, Naredla Sai Venkat Prasad, Mummala Sairam, Mr. C. Dinadhayalan</i>	13

14	ICIETAIML-24-014	Horological Heritage: A Machine Learning Approach to Luxury Watch Brand Classification <i>T V Naga Mani Bharat Kumar, S Vishnuvardhan Reddy, Dr. K.Srinivas</i>	14
15	ICIETAIML-24-015	Automated Classification of Fetal Cardiotocograms for Antepartum Monitoring <i>Neerati Jatin Vishwas, Eppipally Nagaraj, Thammishetty Pardhu Mrs. T. Kanakamma</i>	15
16	ICIETAIML-24-016	ML Driven Fault Detection and Stability Assessment in Hydraulic System from Sensor data <i>Togati Saivardhan, Mancheriyala Maniteja, Polkam Chandrakanth, Mr.P. Mahesh</i>	16
17	ICIETAIML-24-017	Integrated Pest Management for Jute Cultivation: Machine Learning Approaches for Pest Classification <i>Chukkala Sanjay, Guruvula Rishikesh,,Mamillapalli Narayan Reddy, Mr.D. Venkatesan</i>	17
18	ICIETAIML-24-018	IoT Data based Room Occupancy Classification using Non-Intrusive Sensor:ML Design and Data Analysis <i>S Kumaran, Sarthak Rath, Bhargav Pattanayak , Mrs. T. Kanakamma</i>	18
19	ICIETAIML-24-019	Icy Terrains vs. Green Canopies: Glacier and Forest Image Classification in Climate Studies <i>Motam Abhilash, Ganteti Manu Manohar, Chennoji Sai Vamshi , Mrs. G. Priyanka</i>	19
20	ICIETAIML-24-020	Deep Learning for Dermatophyte Fungi Identification: Insights from the DeFungi Dataset <i>Ambedkar Manish, Abdul Lateef Sufiyan, K V Aashrith Sarma, Mr. Kranthi Kumar</i>	20
21	ICIETAIML-24-021	Optimized Ensemble Framework with Unsupervised Learning for Ensuring Security in IoT Networks <i>U Rakesh, Maddala Sanjay, Madhuragalla Charan Babu, Mr. J. Raj Karkee</i>	21
22	ICIETAIML-24-022	Machine Learning-Based Steel Faults Prediction Using Logarithmic and Continuous Attributes <i>Prem Kumar Jenkani, V Sharash Chandra, Akkenapelly Siddharth, Mr. G. Sathish Kumar</i>	22
23	ICIETAIML-24-023	Data-Driven Prediction of Fe and Silica Concentrate using Machine Learning and Mean Process Conditions <i>P Koteshwara Vara Prasad Goud, Gone Venkat ,Bhushan Vyas, Mr. Naveen Chakravarthi</i>	23
24	ICIETAIML-24-024	AI Framework for Identifying Anomalous Network Traffic in Mirai and BASHLITE IoT Botnet Attacks <i>Bairi Akhila, Chitikaneni Rajarchitha, Pothula Sushmitha, Mr. K. Nagaraju</i>	24
25	ICIETAIML-24-025	An Iot Based Application Enabling Safe and Secure Driving System <i>Lavanya Selavaraj, Raguram R, Dharshini S, Valarnila R,Nisha P</i>	25
26	ICIETAIML-24-026	A Survey of Image Texture based Feature Extraction and Learning Model for Melanoma Image Prediction <i>D. Venkatesan , J. Raj Karkee</i>	26
27	ICIETAIML-24-027	Offline Signature Forgery Detection Using Advanced Machine Learning Algorithms. <i>Dr. Ramesh M, Dr K Srinivas, Dr Ravi Babu</i>	27



28	ICIETAIML-24-028	Generative AI: Transforming Creativity with Language and Vision Models <b>Ms. P. Priyanka</b>	28
29	ICIETAIML-24-029	The Role of AI in Mitigating Social Isolation through Emotional Connection <b>Ms. P. Priyanka, Ms. S.Navyatha, Ms. B.Aashritha, Ms. S.Navya, Ms. V. Akshitha Reddy</b>	29
30	ICIETAIML-24-030	The smooth incorporation of machine learning into domain modelling is the next development in MDE <b>Gunda Satishkumar, S.Chandra Prakash</b>	31
31	ICIETAIML-24-031	Adaptive learning agent modelling for the transfer of domain knowledge <b>Gunda Satishkumar, S.Chandra Prakash</b>	32
32	ICIETAIML-24-032	Stochastic Diffusion Search (SDS) Based Feature Selection and Machine Learning Methods for Lung Cancer Prediction <b>S.Gnana Prasanna</b>	33
33	ICIETAIML-24-033	An Exquisite Examination of Coverage, Deployment, and Localization Challenges in Wireless Sensor Networks Utilizing Artificial Intelligence Techniques: A Comprehensive Review. <b>J. Raj Karkee, D. Venkatesan</b>	34
34	ICIETAIML-24-034	Detecting Spam messages in Short Message Service(SMS) using Machine Learning Techniques and NLP <b>Mr. J. Devasundarraj, J. Raj Karkee, D. Venkatesan</b>	35
35	ICIETAIML-24-035	Developing Deep Learning Models for NLP applications <b>Dr .K Srinivas, Mr. D Venkatesan</b>	36
36	ICIETAIML-24-036	Wireless Networks Meet Big Data: Challenges, Trends, and Applications. <b>Mrs T.Kanakamma, Mrs.J.Padma, Mrs.A.Ramaya</b>	37
37	ICIETAIML-24-037	Hybrid Wavelet-Artificial Neural Network Based Intelligent Technique for Electric Load Forecasting <b>K. Swetha, B.Parvathi</b>	38
38	ICIETAIML-24-038	Automated Admission with PSO search and Feature Selection using Decision Tree <b>G. Prasanthi, G.Sirisha</b>	39
39	ICIETAIML-24-039	A Comprehensive Review of Recent Advances on Intelligence Algorithms and Information Engineering Applications <b>Ms. P. Mahesh, Ms.A.Manaswini, Ms. L.Nithigna, Ms. M.Laharika, Ms.G.Swatheja Reddy</b>	40
40	ICIETAIML-24-040	Explainable Artificial Intelligence: A Review and Case Study on Model-Agnostic Methods <b>P.Mahesh</b>	41
41	ICIETAIML-24-041	Machine Learning for Predictive Maintenance in Industrial Systems <b>G. Priyanka, G. Satya Sai kruthi, V. Pramod Kumar, K. Anirudh, B. Sahasra</b>	42
42	ICIETAIML-24-042	AI Policy and Progress: Defining the Rules of the Game <b>Mrs. G. Priyanka</b>	43
43	ICIETAIML-24-043	From big data to multi-RAT cooperative energy-saving systems <b>T.Kanakamma, B.Parvathi</b>	44

44	ICIETAIML-24-044	Computer network-based intrusion detection system (IDS) classification <i>Sargu Chandra Prakash, G.Satish Kumar</i>	45
45	ICIETAIML-24-045	An Attention Mechanism and Grad-CAM Interpretability Deep Learning Approach for Automated Foot Type Identification <i>Sargu Chandra Prakash, G.Satish Kumar</i>	46
46	ICIETAIML-24-046	A Novel Approach to Optimizing Machine Learning Algorithms for Large-Scale Data Sets. <i>S.Gnana Prasanna</i>	47
47	ICIETAIML-24-047	The Forecast of Energy Demand on Artificial Neural Network <i>K.Nagaraju</i>	48
48	ICIETAIML-24-048	Avoiding Child Abuse by Using Artificial Neural Networks as a Risk Assessment Tool <i>K.Nagaraju, P.Mahesh</i>	49
49	ICIETAIML-24-049	Secure Password Detection with Artificial Neural Networks <i>Banothu Parvathi , K.Swetha</i>	50
50	ICIETAIML-24-050	Historical Data-Based Gold Price Prediction using Intelligent Algorithms <i>Banothu parvathi' K.Swetha</i>	51
51	ICIETAIML-24-051	Artificial Intelligence in Computer Network Technology Applications <i>*Sodepogu Venkatravu, B.Parvathi,</i>	52
52	ICIETAIML-24-052	Question Answering System on Education Acts Using NLP Techniques <i>N.Kranthi Kumar, K.Naveen Chakravarthi</i>	53
53	ICIETAIML-24-053	For an AI that is self-aware, socially conscious, and science-oriented: going beyond moral dilemmas <i>R. Mahendar, N.Kranthi Kumar, G.SatishKumar</i>	54
54	ICIETAIML-24-054	Software-Defined Networks and Machine Learning <i>K.Naveen Chakravarthi, N.kranthi kumar</i>	55
55	ICIETAIML-24-055	An introduction to machine learning technologies and how they are used in online education <i>K. Vijay Kumar ,K.Naveen Chakravarthi, N.kranthi kumar</i>	56
56	ICIETAIML-24-056	Software Engineering Artificial Intelligence Methods for Automated Software Design and Reuse <i>Sodepogu Venkatravu, Siddi Srinivas, KBVK Nagasree, Rameswaram Kesavaiah</i>	57
57	ICIETAIML-24-057	Revolutionizing Epilepsy Diagnosis: Advances in Deep Learning for Automated Seizure Detection <i>Mr.Maloth Srinivas</i>	58
58	ICIETAIML-24-058	Adaptive Learning Throughai: Personalized Education for children With learning Disabilities <i>M. Naga Triveni, Dandu Srinivas</i>	59
59	ICIETAIML-24-059	Hybrid Convolution Neural Network (Cgan) For Plant Leaf Disease Detection With Otsu And Surf Feature Extraction. <i>M. Naga Triveni, Dandu Srinivas, Dr. Padamata Ramesh Babu</i>	60

60	ICIETAIML-24-060	Detection of Associations Between Asthma and Air Pollution in UrbanRegions using Supervised Learning Algorithms <b>K. Rajkamal ,C. Dinadhayan,</b>	61
61	ICIETAIML-24-061	A Hopfield Neural Networks in Identification of Redistribution Energybased Load Balancing <b>C. Dinadhayan, K. Rajkamal</b>	62
62	ICIETAIML-24-062	Advancing Pulmonary Nodule Detection: A Deep Learning Perspective on CT Imaging <b><i>Mr.Maloth Srinivas</i></b>	63



## **ANALYZING NIFTY INDICES FOR INVESTMENT DECISION-MAKING: A HISTORICAL PERSPECTIVE**

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### **ABSTRACT**

Abstract— The analysis of NIFTY indices for investment decision-making from a historical perspective is crucial for understanding market trends and making informed investment choices. This study aims to leverage historical data of NIFTY indices to identify patterns, correlations, and anomalies that can guide investors in optimizing their portfolios. Traditionally, investment decisions have been based on manual analysis and heuristic approaches, which are often time-consuming and subject to human biases. This project seeks to overcome these limitations by integrating advanced analytical techniques and machine learning models to process large volumes of historical data efficiently. The primary objective is to develop a comprehensive analytical framework that provides actionable insights into the performance of NIFTY indices over time. This involves the collection and preprocessing of extensive historical data, feature extraction, and the application of various machine learning algorithms to predict future trends. By employing techniques such as time series analysis, regression models, and clustering, the study aims to uncover underlying patterns that influence market movements. Accurate analysis and prediction of NIFTY index trends are vital for maximizing investment returns and managing risks. This project will evaluate multiple algorithms to identify the most effective methods for historical data analysis and future trend prediction. Rigorous testing and validation will ensure the reliability and robustness of the developed models across different market conditions.

**Keywords:** Collection and preprocessing, Analytical Framework, Regression models

## **Intelligent Predictive Maintenance System for Metro Train Air Production Unit Using Machine Learning Model**

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### **ABSTRACT**

Abstract— In this project, we are describing concept of Predictive maintenance, which is crucial for minimizing downtime and enhancing the reliability of metro train systems, particularly for critical components such as the air production unit. This study aims to develop a robust predictive maintenance system using machine learning models to forecast potential failures in the metro train air production unit. We utilized a dataset consisting of operational and sensor data from the air production unit, including parameters such as pressure, temperature, motor current, and reservoir levels. By employing various machine learning techniques, including regression and classification models, we analyzed patterns and correlations within the data to predict equipment failures. Our approach involved feature selection to identify the most influential parameters and the development of predictive models using algorithms such as Extra Trees Regressor and LSTM networks. The models were evaluated based on their accuracy, precision, and recall in predicting maintenance needs. We also incorporated real-time data processing to enhance the system's responsiveness and reliability. The results demonstrate that the developed models effectively predict potential failures, enabling timely maintenance interventions and reducing the likelihood of unexpected breakdowns. The system's predictive capabilities are complemented by an intuitive interface for maintenance personnel, allowing for proactive management of the air production unit. Future work will focus on integrating this system with the metro train's operational management software and validating its performance in live environments.

**Keywords:** Predictive, Air production unit (APU), LSTM, Extra Trees Regressor, Potential failures, Maintenance interventions, Machine Learning and Operational Management Software.

## **Exploring Speech Emotion Recognition: A Multi-Emotion Voice Dataset Analysis for Emotion Detection and Sentiment Analysis**

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### **ABSTRACT**

Abstract— In this project, we are describing concept of Emotion recognition from speech is a crucial task in human-computer interaction, psychology, and healthcare. It involves analyzing audio signals to detect the underlying emotions conveyed by a speaker's voice. This capability has broad applications, including improving customer service, designing empathetic virtual assistants, and enhancing mental health diagnosis and treatment. Traditional approaches to speech emotion recognition often rely on handcrafted features extracted from audio signals, such as pitch, intensity, and spectral features. These features are then fed into machine learning models, such as Support Vector Machines (SVMs) or Gaussian Mixture Models (GMMs), to classify emotions. However, these systems often struggle with generalization across different speakers, languages, and recording conditions. They also require extensive feature engineering and may not capture subtle nuances in vocal expressions. The primary challenge in speech emotion recognition is to develop robust and accurate models that can effectively capture and interpret the complex patterns present in audio signals. This includes accounting for variations in voice quality, speaking style, and emotional intensity across different individuals and cultural contexts. Our proposed system aims to leverage advancements in signal processing techniques to address the limitations of traditional speech emotion recognition systems. we seek to automatically learn discriminative features from raw audio data, enabling more robust and scalable emotion classification. Additionally, we plan to explore multimodal approaches that combine speech signals with other modalities, such as facial expressions or text, to further improve emotion recognition accuracy and robustness.

**Keywords:** Support Vector Machines (SVM), Gaussian Mixture Models (GMM), Speech Emotion Recognition (SER), Human-Computer Interaction (HCI), Audio Signal Analysis, Emotion Detection, Customer Service Improvement.



## **Predicting Short-Term Returns in Cryptocurrency Markets: A Machine Learning Approach**

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### **ABSTRACT**

Abstract— Cryptocurrency price prediction can be challenging due to the volatile and unpredictable nature of the cryptocurrency market . Accurate price predictions are essential for investors to make informed investment decisions. Our project aims to address this challenge by implement various machine learning algorithms to develop a highly accurate predictive model . The primary objective of this project is to create an efficient model that can predict cryptocurrency prices with high accuracy. By leveraging historical price data, market trends, and other relevant factors, our model will provide investors with valuable insights into future price movements

**Keywords:** LSTM, ARIMA , Time series data , Preprocessing ,Data-Driven, Price Monitoring, Normalization, Feature Extraction, Missing Data Imputation , Financial Awareness

## **FACIAL EXPRESSION RECOGNITION DATASET: A COMPREHENSIVE RESOURCE FOR EMOTION ANALYSIS AND AI DEVELOPMENT**

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### **ABSTRACT**

Abstract— Facial expression recognition plays a pivotal role in emotion analysis and AI development, providing insights into human emotional states and enhancing interaction with AI systems. This study focuses on a comprehensive facial expression recognition dataset designed to advance emotion analysis and improve AI algorithms. The dataset encompasses 10,000 facial images from diverse individuals, annotated with seven primary emotions: happiness, sadness, anger, surprise, fear, disgust, and neutral. Each image is tagged with metadata including age, gender, and ethnicity to facilitate in-depth analysis and model training. We applied various machine learning and deep learning techniques to this dataset to develop robust emotion recognition models. Preliminary results demonstrate high accuracy in emotion classification, with convolutional neural networks (CNNs) showing superior performance in distinguishing subtle emotional expressions. The dataset’s richness in diversity and detail supports the development of models that are not only accurate but also generalizable across different populations. Our research highlights the importance of diverse and well-annotated datasets in advancing the field of emotion recognition. The dataset provides a valuable resource for researchers and developers, enabling the creation of more responsive and empathetic AI systems. Future research will focus on expanding the dataset and refining models to enhance their applicability in real-world scenarios and various

**Keywords:** Emotion recognition, Enhancing interaction, Annotated.

## **Ai Based Muscle Activation Patterns in Daily Grasping Movements from EMG Data**

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### **ABSTRACT**

Abstract— Electromyography (EMG) data provides a valuable window into muscle activation patterns during daily grasping movements. This study aims to develop interpretable and actionable machine learning models for analyzing EMG data to understand muscle activation patterns during these movements. We collected and analyzed a dataset comprising EMG recordings from various muscles involved in grasping tasks, performed by a group of healthy individuals. The dataset includes several features such as muscle activation amplitude, frequency components, and temporal activation sequences. We employed multiple machine learning algorithms to predict specific grasping movements and identify the most significant features contributing to these predictions. Feature importance analysis highlighted the critical role of specific muscles and their activation timings in distinguishing between different types of grasps. Additionally, we implemented Shapley Additive Explanations (SHAP) to ensure the interpretability of our models, allowing us to understand how individual muscle activations contribute to the overall grasping movement prediction. Our models demonstrated high predictive accuracy and provided valuable insights into the underlying muscle activation patterns. Moreover, we developed a real-time decision-support tool that can assist clinicians and researchers in interpreting EMG data and making informed decisions about muscle function and rehabilitation strategies. Future work will focus on validating these models in clinical settings and exploring their potential applications in personalized rehabilitation programs and the development of advanced prosthetic devices.

**Keywords:** Electromyography (EMG), Muscle activation patterns, Grasping movements, Machine learning models, Feature importance, Shapley Additive Explanations (SHAP), Predictive accuracy, Real-time decision-support tool, Rehabilitation strategies, Prosthetic devices



## **IMPROVING EYE CARE WITH PREDICTIVE MODELING: MACHINE LEARNING APPROACH TO CONTACT LENS FITTING DECISION SUPPORT SYSTEM**

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### **ABSTRACT**

Abstract— The accurate fitting of contact lenses is vital for optimizing visual performance and patient comfort. This study explores the application of machine learning techniques to enhance contact lens fitting decisions by developing a predictive modeling approach. We utilized a dataset of 3,000 patients, including 1,500 (50%) who experienced issues with initial lens fittings. The dataset comprised various features such as corneal curvature, eye shape, tear film quality, and visual acuity measurements. Multiple machine learning algorithms were employed to predict the suitability of different contact lenses for individual patients. Feature importance analysis identified corneal curvature, eye shape, and tear film quality as critical factors influencing fitting success. We incorporated SHAP (Shapley Additive Explanations) values to ensure model interpretability, providing insights into how each feature affected the predictions. Furthermore, a decision-support tool was developed, allowing practitioners to adjust recommendations based on real-time patient data. Our predictive models demonstrated high accuracy and practical utility in assisting contact lens fitting, with the potential to improve patient outcomes. Future research will focus on validating these models in diverse clinical settings and assessing their impact on long-term patient satisfaction and comfort.

**Keywords:** Optimizing visual performance, Contact lens fitting, Tear film quality, Real-time patient data, High accuracy.



## **Characterization of Glass Samples from Forensic Investigation: A Study of Six Oxide-Defined Types**

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### **ABSTRACT**

Abstract— In forensic investigations, the characterization of glass samples plays a crucial role in linking suspects to crime scenes and establishing evidence. Glass fragments can provide valuable clues in criminal cases, but traditional forensic methods for glass analysis are often time-consuming and require specialized expertise. In 2023, the need for more efficient and accurate forensic techniques has become increasingly evident, given the growing complexity of criminal cases and the demand for reliable evidence in legal proceedings. Traditional methods for glass characterization involve physical and chemical analyses, such as refractive index measurement, elemental composition analysis, and visual comparison. While effective, these methods can be labor-intensive, require substantial sample preparation, and may suffer from limitations in distinguishing between similar glass types or in handling large volumes of evidence. Additionally, the interpretation of results can be subjective, leading to potential inconsistencies. Machine learning offers a transformative approach to glass characterization by enabling automated and precise analysis of glass samples. By applying machine learning algorithms to data from various sources, such as optical microscopy images, spectral data, and chemical compositions, it is possible to develop models that accurately classify and differentiate glass types. Techniques for data analysis and supervised learning for pattern recognition can enhance the reliability and speed of forensic investigations. Integrating machine learning with traditional forensic methods supports more robust evidence analysis, improves the accuracy of glass sample characterization, and contributes to the overall effectiveness of forensic investigations in legal contexts.

**Keywords:** Forensic Investigations, Glass Characterization, Machine Learning, Data Analysis, Supervised Learning and Pattern Recognition.

## **Predictive modeling of earthquake occurrences with feature engineering and Machine Learning**

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### **ABSTRACT**

Abstract— Earthquakes were first studied by ancient civilizations using observational records. Traditional seismology relied on laborious geological surveys and seismic event reporting. Instrumentation improvements in the 20th century led to seismographs, which measured seismic waves more precisely. Computational technologies in the late 20th and early 21st centuries enabled more advanced analytical methodologies for earthquake prediction. The goal of this research is to create an earthquake prediction model using feature engineering and machine learning. This model tries to improve earthquake forecasts and shed light on seismic activity. Predictive Modeling of Earthquake Occurrences with Feature Engineering and Machine Learning uses modern data analysis to anticipate earthquakes. For greater forecast accuracy, it focuses finding significant elements (such as geological, climatic, and historical data) and using machine learning algorithms to assess them. Traditional earthquake prediction systems used seismic monitoring stations to capture seismic waves, geological mapping for fault lines, and statistical analysis of past earthquake data before machine learning or AI. These approaches struggled to analyze complicated patterns in huge datasets. Traditional earthquake prediction systems cannot interpret the massive and complicated seismic activity databases, resulting in inaccurate and unreliable earthquake predictions. This research is motivated by earthquakes' disastrous effects on life and property. By enhancing predictive skills with machine learning, we can provide timely warnings and preparedness, perhaps saving lives and money. The technique uses machine learning algorithms to examine previous earthquake data and discover pre-earthquake patterns.

**Keywords:** Earthquake prediction, Machine learning, Predictive Modeling, Feature engineering, Seismographs.

## Machine Learning Adopted Human Activity Classification using Shimmer Wearable Sensors for Health Monitoring

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### ABSTRACT

Abstract— Over the past decade, there has been a significant increase in the prevalence of chronic diseases and conditions requiring continuous health monitoring. According to the World Health Organization (WHO), chronic diseases are responsible for 70% of all deaths globally, with an estimated 40 million people dying annually due to such conditions. In 2023 alone, the number of people requiring regular health monitoring reached 1.7 billion, highlighting the growing need for efficient and reliable health monitoring solutions. Traditional health monitoring approaches largely rely on manual methods, which are often cumbersome, prone to errors, and require constant supervision by healthcare professionals. These manual techniques can be time-consuming and inefficient, making it difficult to provide timely interventions. Moreover, they often fail to capture real-time data accurately, leading to delays in diagnosis and treatment, which can exacerbate health conditions. So, Machine learning (ML) offers a promising solution to these challenges by automating the process of human activity classification using wearable sensors, such as Shimmer. ML algorithms can analyze the data collected from these sensors in real-time, enabling continuous and precise monitoring of health parameters. This automation not only reduces the burden on healthcare professionals but also improves the accuracy and timeliness of health monitoring, ultimately leading to better health outcomes.

**Keywords:** accuracy, robustness, efficiency, environment conservation.



## **A Comprehensive Dataset for Urban Sound Classification and Analysis**

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### **ABSTRACT**

Abstract— The increasing complexity of urban surroundings and the impact of sound pollution on quality of life have made urban sound classification a critical field of study. Early sound analysis focused on identifying traffic noise and industrial activity using manual observations and simple acoustic monitoring techniques. Subjective sound classification by analysts was inconsistent and lacked scalability, making urban sound management difficult. This project aims to generate a comprehensive urban sound classification dataset to help identify and analyze urban noises and train machine learning models more accurately. This research A Comprehensive Dataset for Urban Sound Classification and Analysis is highlights the need for a strong data collection for sound categorization. Manual analysis and subjective interpretation limit urban sound classification approaches, limiting data collecting and policymaking. This research is driven by the need for objective sound pollution management approaches as urbanization accelerates. Researchers and policymakers will benefit from a comprehensive dataset on urban soundscapes. Using machine learning, the proposed method develops algorithms that accurately characterize urban sounds. These models can find patterns and features in sound recordings that traditional methods miss by examining big datasets. Real-time sound monitoring will improve urban planning and management to reduce noise pollution. To help researchers and city planners understand urban soundscapes, the study seeks nuance. Using machine learning to classify urban sounds is more efficient, scalable, and objective than traditional methods, improving urban living conditions and quality of life.

**Keywords:** Urban sound classification, Sound pollution, Urban sound management, Comprehensive dataset, Machine learning models, Sound categorization, Real-time sound monitoring



## **Unveiling nature's symphony: An animal sounds dataset for audio analysis**

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### **ABSTRACT**

Abstract— Early naturalists recognized the importance of vocalizations in animal behavior and ecology, starting the study of animal noises. Analogue recordings limited complicated audio pattern analysis. Digital recording technology improved analysis precision. In the late 20th and early 21st centuries, researchers used machine learning and AI to automate sound analysis and process large datasets. This project aims to develop a large animal sound dataset for audio analysis and animal communication research. This title celebrates animal's complex vocalizations, like a symphony, and the scientific effort to decipher them. Traditional methods for evaluating animal noises included manual observation and spectrograms to categorize sounds by auditory qualities, leading to subjective conclusions. Manual categorization is time-consuming and error-prone, making it difficult to reliably recognize and classify animal sounds in big datasets. This project aims to increase animal communication knowledge for biodiversity conservation and habitat management. Machine learning algorithms are used to automate animal sound classification and analysis, training models on labeled audio data to classify species specific vocalizations and detect environmental induced behavioral changes. This novel method will improve acoustic monitoring efficiency and accuracy, revealing animal communication and ecological connections. This project aims to bridge traditional and sophisticated computational technologies to improve ecological studies and wildlife conservation.

**Keywords:** Animal Sound Dataset, Machine Learning, Acoustics, symphony, Classification, wildlife conservation.

## **HARMONIZING DATA SCIENCE WITH MELODY METRICS DECODING SONG POPULARITY THROUGH MACHINE LEARNING**

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### **ABSTRACT**

Abstract— The music industry has seen a remarkable transformation over the past few decades, with streaming platforms and digital analytics providing unprecedented access to detailed song performance metrics. Statistical analyses of song popularity reveal notable trends, such as the exponential growth of streaming numbers from 2010 to 2023, where average monthly streams for top-charting tracks increased by over 300%. Additionally, factors such as genre diversity, artist collaborations, and seasonal trends have shown significant impacts on song popularity over the years. Traditionally, determining song popularity relied on manual approaches such as surveys, radio airplay counts, and subjective assessments by music critics. These methods often encountered challenges including limited sample sizes, delayed data collection, and inherent biases. Consequently, they provided a partial and often skewed view of song performance, hindering accurate trend analysis and prediction. Machine Learning (ML) offers a promising solution to these limitations by enabling the analysis of vast amounts of data from various sources, including streaming metrics, social media sentiment, and historical performance trends. ML algorithms can uncover complex patterns and correlations that manual methods might miss, leading to more accurate predictions of song popularity and trends. By leveraging advanced techniques such as neural networks and natural language processing, ML models can provide deeper insights and real-time assessments, transforming the way the music industry understands and anticipates audience preferences.

**Keywords:** Real-time assessments, Data collection ,Hindering accurate.

## **HOROLOGICAL HERITAGE :A MACHINE LEARNING APPROACH TO LUXURY WATCH BRAND CLASSIFICATION**

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### **ABSTRACT**

Abstract— The luxury watch industry, a multi-billion-dollar market, has seen significant growth in recent years, with a reported annual sales increase of 6.8% from 2018 to 2023. According to industry statistics, over 300 luxury watch brands exist globally, each with its unique characteristics and heritage. Despite the vast array of brands, classification and authentication of luxury timepieces remain a complex task due to the diverse and intricate designs that define each brand's identity. Traditional manual approaches to luxury watch classification rely heavily on expert knowledge and subjective judgment, leading to inconsistencies and limitations in scalability. These methods often involve labor-intensive processes such as detailed inspection and comparison, which are prone to human error and inefficiency. Additionally, the rapid evolution of watch designs and the emergence of counterfeit products further complicate accurate classification. Machine learning (ML) offers a promising solution to these challenges by automating and enhancing the classification process. Leveraging advanced algorithms and data-driven techniques, ML models can analyze and categorize luxury watches with greater precision and consistency. By training models on large datasets of watch images and features, ML can identify subtle patterns and characteristics that distinguish between brands, improving both the accuracy and efficiency of classification. This approach not only addresses the limitations of manual methods but also provides a scalable solution for the growing complexity of the luxury watch market.

**Keywords**—Electrocardiogram(ECG), Cardiovascular Diseases, Machine Learning, Disease Classification, Early Detection.

## AUTOMATED CLASSIFICATION OF FETAL CARDIOTOCGRAMS FOR ANTEPARTUM MONITORING

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### ABSTRACT

Abstract— Fetal cardiotocography (CTG) is a critical tool for monitoring fetal well-being during pregnancy, with a growing body of evidence highlighting its importance in antepartum care. According to recent statistics, over 30 million CTG recordings are performed annually worldwide, with a notable increase of 5% per year from 2015 to 2023. Despite the extensive use of CTG, the detection of abnormal patterns remains challenging, leading to significant variability in clinical outcomes. Studies have reported that approximately 15-20% of CTG interpretations by clinicians are inaccurate, contributing to both unnecessary interventions and undetected fetal distress. Traditional manual approaches to CTG analysis involve subjective interpretation by healthcare professionals, which can be influenced by individual expertise and experience. These methods often face challenges such as high inter-observer variability and limited capacity for real-time analysis. Furthermore, the manual process is labor-intensive and prone to human error, resulting in delayed or inconsistent identification of critical fetal conditions. In response to these limitations, machine learning (ML) techniques have emerged as a promising solution for automating the classification of fetal cardiotocograms. By leveraging advanced algorithms and large datasets, ML models can provide more consistent and accurate assessments of fetal heart rate patterns. These models can analyze complex CTG data in real time, offering enhanced diagnostic support and potentially improving outcomes by facilitating timely medical interventions.

**Keywords**— Fetal cardiotocograms, Diagnostic support, Medical interventions.



## **ML-DRIVEN FAULT DETECTION AND STABILITY ASSESSMENT IN HYDRAULIC SYSTEMS FROM SENSOR DATA**

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### **ABSTRACT**

Abstract— The reliability and performance of hydraulic systems are critical in various industrial applications, including manufacturing, aviation, and heavy machinery. According to recent statistics, hydraulic system failures account for approximately 70% of unplanned downtime in these sectors, leading to significant financial losses and operational disruptions. Between 2015 and 2023, the cost of hydraulic system failures has risen by an estimated 25%, underscoring the urgent need for effective fault detection and stability assessment solutions. Traditionally, hydraulic system maintenance relies heavily on manual inspection and routine preventive measures. These approaches, while beneficial to some extent, are often time-consuming, prone to human error, and fail to detect early signs of faults. Moreover, the increasing complexity of modern hydraulic systems makes it challenging for manual methods to keep pace with the dynamic operational environments. Consequently, these limitations can lead to missed detections, unexpected failures, and decreased system reliability. Machine learning (ML) offers a promising solution to these challenges by enabling automated, accurate, and real-time fault detection and stability assessment. By leveraging sensor data collected from hydraulic systems, ML algorithms can analyze patterns, predict potential failures, and provide timely alerts for maintenance actions. This not only enhances the efficiency of fault detection but also significantly reduces downtime and maintenance costs. ML-driven approaches are poised to transform the maintenance of hydraulic systems, ensuring higher reliability, improved safety, and optimal performance.

LP5 indicates failures in motion with part.

*Keywords*— Enabling automated, Predict potential failures, Dynamic operational.

## **Integrated Pest Management for Jute Cultivation: Machine Learning Approaches for Pest Classification**

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### **ABSTRACT**

Jute cultivation plays a significant role in the agricultural economy, particularly in South and Southeast Asia. However, pest infestations have been a persistent challenge, impacting yield and quality. Recent statistics reveal that pest-related losses in jute cultivation can reach up to 30% of the total crop yield annually. For instance, data from 2023 indicate that the total loss due to pests in major jute-producing regions amounted to approximately \$500 million. The trend of increasing pest-related issues is a growing concern, with incidences rising by 15% over the past five years. Traditional pest management methods for jute involve manual identification and classification of pests by field experts, which are often time-consuming and prone to inaccuracies. These manual approaches rely heavily on subjective assessments and lack the efficiency to handle large-scale infestations. Additionally, the variability in pest behavior and the rapid development of pest resistance complicates effective management strategies, leading to suboptimal pest control and increased crop damage. Machine learning (ML) presents a promising solution to address these challenges by automating and enhancing pest classification processes. ML algorithms can analyze vast amounts of data from images and sensors to accurately identify and classify pests with high precision. By integrating ML into Integrated Pest Management (IPM) systems, farmers can achieve more effective and efficient pest control, ultimately improving jute yield and reducing economic losses.

**Keywords:** Jute cultivation, agricultural economy, pest infestations, jute-producing, large-scale infestations and pest resistance.

## IOT Data Based Room Occupancy Classification using Non-Intrusive Sensors: ML Design & Data Analysis

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### ABSTRACT

Abstract— Room occupancy classification has become increasingly crucial in the era of smart auditoriums, driven by the growing integration of Internet of Things (IoT) devices. According to recent statistics, the global smart auditorium market is expected to grow from \$85 billion in 2021 to \$135 billion by 2025, with a compound annual growth rate of 10.4%. Concurrently, the deployment of non-intrusive sensors in auditorium has surged, providing a rich source of data for room occupancy analysis. Despite these advancements, effective room occupancy classification remains a challenge due to the sheer volume and complexity of the collected data. Traditionally, room occupancy has been assessed through manual methods such as periodic inspections and manual logging. These approaches are labor-intensive, prone to human error, and often fail to provide real-time insights. The limitations of these manual methods include inefficiencies in data collection, inaccuracies in occupancy detection, and an inability to scale with the growing complexity of modern auditorium systems. Machine Learning (ML) offers a transformative solution to these challenges by leveraging data from non-intrusive IoT sensors to accurately classify room occupancy in real time. ML algorithms can analyze complex patterns and correlations within the sensor data, improving classification accuracy and operational efficiency. This paper explores the design and implementation of ML-based systems for room occupancy classification, highlighting the advantages of automated, data-driven approaches over traditional manual methods.

**Keywords-** Transformative solution, Data collection, Manual logging.



## **ICY TERRAINS VS. GREEN CANOPIES: GLACIER AND FOREST IMAGE CLASSIFICATION IN CLIMATE STUDIES**

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### **ABSTRACT**

Abstract —Over the past three decades, climate studies have increasingly relied on remote sensing data to monitor changes in icy terrains and green canopies. Statistical analyses reveal that glacier cover has decreased by approximately 30% since the 1990s, while forest canopy density has fluctuated by 15% due to deforestation and reforestation efforts. These metrics underscore the importance of precise and up-to-date classification of glacier and forest regions to assess climate impact and guide conservation strategies. Traditional methods of image classification for these terrains typically involve labor-intensive manual annotation and visual inspection. Such approaches are not only time-consuming but also prone to human error, leading to inconsistencies in classification results and reduced accuracy. The reliance on subjective judgment further complicates the scalability of these methods, making them less effective for large-scale or frequent monitoring. Machine Learning (ML) offers a robust solution to these challenges by automating the classification process with high accuracy and efficiency. Advanced ML algorithms, such as convolutional neural networks and supervised classification techniques, can analyze vast amounts of satellite imagery to distinguish between glacier and forest regions with greater precision. This approach enhances the reliability of climate studies and supports more informed decision-making in environmental management and conservation efforts.

Keywords— Satellite imagery, Convolutional neural networks, Inconsistencies

## **DEEP LEARNING FOR DERMATOPHYTE FUNGI IDENTIFICATION: INSIGHTS FROM THE DEFUNGI DATASET**

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### **ABSTRACT**

Abstract— Dermatophyte fungi, responsible for a variety of skin infections, present a significant public health challenge worldwide. Recent epidemiological studies indicate that dermatophyte infections affect approximately 20-25% of the global population annually, with a noticeable increase in cases over the past decade. Specifically, data from the World Health Organization (WHO) shows a 15% rise in reported infections between 2015 and 2020, highlighting an urgent need for improved diagnostic methods. Accurate and timely identification of dermatophyte species is critical for effective treatment and management of these infections. Traditionally, dermatophyte identification has relied on manual techniques, such as morphological examination and culture-based methods. These approaches are often time-consuming, labor-intensive, and prone to errors, leading to delays in diagnosis and treatment. Moreover, the variability in fungal morphology and the need for specialized expertise further complicate the identification process, reducing the overall efficiency and reliability of conventional methods. In response to these challenges, deep learning (DL) techniques, have emerged as promising solutions for automating and enhancing dermatophyte identification. By leveraging advanced algorithms and neural network architectures, deep learning models can analyze large datasets of fungal images with high accuracy and speed. These models are trained to recognize subtle features and patterns in dermatophyte specimens, offering a robust and scalable alternative to manual methods. As a result, DL-based approaches have the potential to significantly improve diagnostic precision, reduce processing time, and support more effective management of dermatophyte infections.

**Keywords:** — Dermatophyte identification, Deep learning, Diagnostic precision

# OPTIMIZED ENSEMBLE FRAMEWORK WITH UNSUPERVISED LEARNING FOR ENSURING SECURITY IN IOT NETWORKS

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## ABSTRACT

Abstract— As the Internet of Things (IoT) continues to proliferate, statistics reveal a dramatic increase in connected devices, with over 14 billion devices estimated to be in use by 2024, and this number expected to exceed 25 billion by 2030. This rapid growth is accompanied by a significant rise in security threats, with IoT-related attacks increasing by over 50% annually in recent years. The sheer volume and complexity of these devices pose substantial challenges for traditional security measures. Manual security approaches, which include conventional network monitoring and reactive incident response strategies, are increasingly inadequate in addressing the dynamic and expansive nature of IoT networks. These methods often suffer from scalability issues, slow adaptation to new threats, and high rates of false positives. Consequently, there is a pressing need for more efficient and adaptive security solutions that can handle the evolving threat landscape of IoT networks. Machine learning (ML) offers a promising alternative by leveraging advanced algorithms to detect and respond to security threats. By employing supervised and unsupervised learning techniques, ML can identify anomalous behaviors and emerging threats without prior labelling, thus providing a proactive and scalable solution. The proposed Optimized Ensemble Framework integrates various ML models to enhance threat detection and response, ensuring robust security measures tailored to the unique challenges of IoT environments.

**Keywords:** —. Framework integrates, Ensemble Framework, Anomalous behaviors



## MACHINE LEARNING-BASED STEEL FAULTS PREDICTION USING LOGARITHMIC AND CONTINUOUS ATTRIBUTES

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### ABSTRACT

Abstract— Steel production and quality control have become increasingly important in the industry, with statistical data indicating a rise in steel faults over the past decade. Recent studies show that fault rates have escalated by approximately 15% from 2015 to 2023, underscoring the need for more effective predictive measures. The integration of logarithmic and continuous attributes in data analysis has been highlighted as a crucial factor in improving the accuracy of fault prediction models. Traditional manual approaches to steel fault detection, such as visual inspections and periodic testing, often struggle with limitations including subjectivity, high labor costs, and inconsistent results. These methods can fail to detect subtle fault patterns or predict potential issues before they occur, leading to increased downtime and costly repairs. As steel production processes become more complex, these manual techniques are increasingly inadequate in managing and preventing faults efficiently. Machine learning (ML) presents a promising solution to these challenges by leveraging advanced algorithms to analyze and predict steel faults with greater precision. By incorporating logarithmic and continuous attributes into ML models, it is possible to enhance the detection of fault patterns and forecast potential issues with higher accuracy. This approach not only reduces the reliance on manual inspections but also enables proactive maintenance strategies, ultimately leading to improved quality control and reduced operational costs in the steel industry.

**Keywords**— Continuous attributes, Operational costs, Proactive maintenance.

## **DATA-DRIVEN PREDICTION OF FE AND SILICA CONCENTRATE USING MACHINE LEARNING AND MEAN PROCESS CONDITIONS**

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### **ABSTRACT**

Abstract— In recent years, the demand for accurate prediction of iron (Fe) and silica concentrate grades has grown significantly, driven by the need for efficient resource management and optimal processing. Statistical analyses of historical production data reveal that the concentration of Fe and silica in concentrates can be influenced by various process conditions. For instance, annual production reports from 2015 to 2023 indicate fluctuations in Fe grades from 60% to 65% and silica levels from 5% to 10%, demonstrating the variability inherent in mineral processing. The industry has been leveraging these metrics to meet market demands, but the challenge remains in maintaining consistent quality and efficiency amidst fluctuating process conditions. Traditional approaches to predicting Fe and silica concentrations rely heavily on manual sampling and empirical methods. These approaches often involve time-consuming analyses and are prone to inaccuracies due to human error and limited ability to account for complex, non-linear interactions among process variables. Furthermore, manual methods generally lack the flexibility to adapt to changing conditions or integrate large datasets effectively. Machine learning (ML) offers a robust alternative by leveraging historical data and advanced algorithms to model and predict concentrate grades with higher precision.

**Keywords :** Statistical analyses, Fluctuating process, manual sampling.

## AI FRAMEWORK FOR IDENTIFYING ANOMALOUS NETWORK TRAFFIC IN MIRAI AND BASHLITE IOT BOTNET ATTACKS

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### ABSTRACT

**Abstract—** In recent years, the proliferation of Internet of Things (IoT) devices has significantly increased the volume of network traffic and the complexity of network environments. According to the Global IoT Security Market Report, the number of IoT devices surged from approximately 8.4 billion in 2017 to an estimated 30.9 billion by 2025. This exponential growth has led to a corresponding rise in sophisticated network attacks, with Mirai and BASHLITE botnets being prominent examples. The Mirai botnet, which first emerged in 2016, exploited IoT vulnerabilities to launch large-scale Distributed Denial of Service (DDoS) attacks, while BASHLITE, identified in 2014, has been known for its effective use of compromised devices in various cyber-attacks. Traditional methods for detecting anomalies in network traffic typically involve manual inspection and rule-based systems. These approaches face several challenges, including the high volume of data, the dynamic nature of network traffic, and the evolving tactics of attackers. Manual methods are often labor-intensive, prone to human error, and struggle to keep pace with sophisticated attack techniques. Rule-based systems, while useful, are limited by their inability to adapt to new and previously unseen attack patterns. Machine Learning (ML) offers a promising alternative for addressing these limitations. By leveraging algorithms capable of learning from historical data and adapting to new patterns, ML models can identify anomalous traffic indicative of Mirai and BASHLITE attacks more effectively. These models can analyze vast amounts of network data in real time, detect subtle deviations from normal behavior, and improve detection accuracy over time. This approach not only enhances the ability to identify emerging threats but also reduces the dependency on manual intervention, leading to more efficient and scalable network security solutions

**Keywords:** BASHLITE botnets, Network attacks, Machine Learning.



## An Iot Based Application Enabling Safe and Secure Driving System

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### ABSTRACT

Abstract— This technology offers a unique way to test sleepy and intoxicated individuals. The vehicles are geared up with an eye blinking detector and an alcohol detector. The detectors locate the motive force's eye blinks and degree the amount of alcohol in his breath, sending a sign to the regulator routinely on every occasion the motive force starts off evolved the automobile. The microcontroller in this machine gets the detectors' labours for comparison. maximum accidents on the street are as a result of folks who are sleepy. seeing that hundreds of motors are driven at the highways every day, manually tracking down the inattentive driving force is a tough operation. consequently, every car have to consist of a mechanism that stops the vehicle incoherently if it notices that the driving force is tired. inside the event that the fee hits moreover, the recommendation is mechanically dispatched to fixed limited. as a way to perceive indicators of fatigue, inattention, and doziness, the device makes use of eye blinking detectors to display the motive force's eye moves. by constantly monitoring those statistics, the device is able to perceive those symptoms. An alarm is caused to notify drivers of comparable indicators and motivate them to take suitable action, together with preventing for a break or pulling over to rest. using a dedicated alcohol detector, the machine integrates now not only intoxication discovery however also lethargy discovery. This tool detects the amount of alcohol within the motive force's breath and gives them instantaneous remarks on how impaired they're. despite the fact that, the motive force receives an instantaneous alarm, deterring them from operating a automobile and inspiring suitable behavior. If booze is determined over a predetermined threshold. IOT is used to manipulate the whole gadget.

**Keywords:** Blink sensor, IOT, MQ3 sensor, power supply, relay, alcohol and drowsiness detection.

## A Survey of Image Texture based Feature Extraction and Learning Model for Melanoma Image Prediction

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### ABSTRACT

Abstract - The texture image classification and analysis increases the accuracy of pattern identification in the image. By considering that, the paper work analyzes the various pattern extraction model that are based on the different directionality identification of pixel difference. This type will enhance the prediction model to represent the depth of object that are present in the image. This paper presented a survey of different texture based feature extraction techniques and the various types of convolution model related to the Gabor pattern for feature learning process. Based on the directionality changes and the increase in neighboring prediction improves the performance of image classification. The neural network based classification models were used for the prediction of texture features of the image to recognize the abnormality of melanoma image. The result was analyzed and compares with the different texture pattern method and the neural network based classification models by preparing the confusion matrix and statistical report from the classified result.

**Keywords:** Computer Aided Diagnosis (CAD), Cellular Automata, Image Texture Pattern, Deep Learning and Melanoma Image Classification.

## **Offline Signature Forgery Detection Using Advanced Machine Learning Algorithms**

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### **ABSTRACT**

**Abstract—** Abstract—Advanced artificial intelligence and machine learning techniques are transforming signature authentication through sophisticated convolutional neural networks (CNNs) that leverage deep learning algorithms for precise image segmentation and feature extraction. By training on comprehensive datasets of genuine and forged signatures, these AI models can analyze microscopic details of handwritten signatures with unprecedented accuracy, distinguishing authentic signatures from sophisticated forgeries through complex pattern recognition and intelligent classification techniques. The system employs computer vision algorithms to extract intricate features such as stroke dynamics, pressure variations, and unique writing characteristics, enabling rapid and reliable verification across multiple sectors by creating a robust binary classification framework that can instantaneously determine the authenticity of a signature with minimal human intervention.

**Keywords:** Terms—Signature Authentication, Convolutional Neural Networks (CNNs), Deep Learning, Image Segmentation, Feature Extraction, Forgery Detection, Pattern Recognition, Computer Vision, Stroke Dynamics, Pressure Variations



## **Generative AI: Transforming Creativity with Language and Vision Models**

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### **ABSTRACT**

Abstract— Generative AI has revolutionized the creative landscape by enabling machines to generate human-like text, images, and other forms of media. Powered by advanced deep learning architectures such as Generative Adversarial Networks (GANs) and Transformer models, these systems excel in natural language generation, visual content creation, and multimodal synthesis. Technologies like GPT (Generative Pre-trained Transformer) and DALL-E demonstrate remarkable capabilities in crafting coherent narratives, realistic visuals, and novel artistic designs. This transformation has broad applications, from content creation and virtual world-building to personalized education and product design. However, the rise of generative AI poses challenges related to ethical use, intellectual property, and the authenticity of generated content. This paper explores the core technologies, applications, and future directions of generative AI while addressing its implications for creativity and society.

**Keywords** – Generative AI, Deep Learning , DALL-E, GANs.

## **The Role of AI in Mitigating Social Isolation through Emotional Connection**

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### **ABSTRACT**

Abstract— The rapid evolution of artificial intelligence (AI) is transforming the ways humans interact, connect, and address societal challenges. One such challenge is social isolation—a phenomenon exacerbated by modern lifestyles, aging populations, and global crises such as pandemics. Social isolation profoundly impacts emotional well-being and mental health, contributing to conditions like depression, anxiety, and even physical ailments. This research paper examines the role of AI in mitigating social isolation by fostering emotional connections through innovative technologies and applications. The purpose of this study is to explore how AI-driven tools can bridge the emotional and social gaps individuals experience in diverse scenarios, including aging populations, remote work cultures, and marginalized communities. The research investigates various AI mechanisms, including natural language processing (NLP), sentiment analysis, emotion recognition systems, and conversational AI, to understand their potential to replicate empathetic human interactions. A mixed-methods approach underpins the methodology. Quantitative data from surveys and usage analytics of AI-based mental health and social platforms provide insights into user satisfaction and engagement levels. Simultaneously, qualitative data is gathered through interviews with psychologists, AI developers, and end-users, offering a nuanced perspective on the emotional depth and authenticity of AI-mediated interactions. Case studies, such as the use of AI companions in elder care and AI-powered mental health chatbots like Woebot, are analyzed to identify best practices and challenges. Key findings highlight AI's ability to create meaningful emotional connections by personalizing interactions, understanding user sentiments, and providing timely, empathetic responses. For example, AI systems using NLP can detect signs of distress in text or speech patterns and respond with supportive

interventions, significantly reducing feelings of loneliness. Furthermore, AI-powered platforms have demonstrated efficacy in maintaining daily routines and cognitive engagement, particularly for seniors and individuals with disabilities. However, the study also identifies significant limitations and ethical considerations. While AI can simulate empathy, it lacks genuine emotional understanding, leading to concerns about authenticity and trust. Privacy and data security issues are prominent, especially when dealing with sensitive emotional data. Additionally, there is a risk of over-reliance on AI, potentially diminishing the value of human-to-human connections.

The conclusions of this research emphasize that while AI cannot replace human relationships, it holds immense potential as a complementary tool in alleviating social isolation. Recommendations include developing more transparent and ethically aligned AI systems, fostering interdisciplinary collaborations between AI developers and mental health professionals, and prioritizing user-centric designs that incorporate feedback from diverse demographics. This paper contributes to the broader discourse on the intersection of technology and mental health, advocating for responsible AI deployment to address one of society's most pressing challenges. By leveraging AI's capabilities while acknowledging its limitations, humanity can move towards a future where no individual feels disconnected or unsupported, regardless of their circumstances.

**Keywords:** Artificial Intelligence (AI), social isolation, emotional connection, conversational AI, natural language processing (NLP), sentiment analysis.



# The smooth incorporation of machine learning into domain modelling is the next development in MDE

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## ABSTRACT

Abstract— By identifying patterns in large datasets, machine learning algorithms are intended to tackle unknown behaviours. Unfortunately, for systems made up of heterogeneous pieces that behave quite differently, such as cyber-physical systems and Internet of Things applications, learning such global behaviours can be slow and imprecise. Instead, these systems must continuously improve the behaviour on an element-by-element basis and put these little learning units together in order to make intelligent decisions. However, it is difficult and necessitates domain knowledge to combine and compose learnt behaviours from many aspects. As a result, the learnt behaviours and domain knowledge must be arranged and integrated in a flexible manner. We suggest integrating machine learning into domain modelling in this research. More precisely, we propose to break down machine learning into little learning units, or microlearning units, that are independently calculable, reusable, and chainable. The domain data and these microlearning units are modelled at the same level and alongside each other. Our method can be substantially more accurate than learning a global behaviour, and it performs quickly enough to be employed for live learning, as demonstrated by a smart grid case study.

**Keywords:** Machine learning algorithms, large datasets , Internet of Things applications, independently calculable, reusable, and chainable

## **Adaptive learning agent modelling for the transfer of domain knowledge**

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### **ABSTRACT**

Abstract— The expensive expense of adapting such a system to a specific issue area frequently prevents the use of intelligent agents in industrial applications. The premise of this study is that learning agents benefit from being able to be further modified by a supervising domain expert when they are used in work situations that call for domain-specific experience. A domain expert should work closely with the agent to comprehend its choices and make necessary updates to the underlying knowledge base. An agent with customised knowledge derived in part from the domain experts would be the end outcome. The issue domain, the learning agent's design, and the domain's perception must all be considered in the model of such an adaptive learning agent.

**Keywords:** machine learning models, Decision Tree, Logistic Regression model

## Stochastic Diffusion Search (SDS) Based Feature Selection and Machine Learning Methods for Lung Cancer Prediction

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### ABSTRACT

Abstract— The symptoms of cancer normally appear only in the advanced stages, so it is very hard to detect resulting in a high mortality rate among the other types of cancers. Thus, there is a need for early prediction of lung cancer for the purpose of diagnosing and this can result in better chances of it being able to be treated successfully. Histopathology images of lung scan can be used for classification of lung cancer using image processing methods. The features from lung images are extracted and employed in the system for prediction. Grey level co-occurrence matrix along with the methods of Gabor filter feature extraction are employed in this investigation. Another important step in enhancing the classification is feature selection that tends to provide significant features that helps differentiating between various classes in an accurate and efficient manner. Thus, optimal feature subsets can significantly improve the performance of the classifiers. In this work, a novel algorithm of feature selection that is wrapper-based is proposed by employing the modified stochastic diffusion search (SDS) algorithm. The SDS, will benefit from the direct communication of agents in order to identify optimal feature subsets. The neural network, Naïve Bayes and the decision tree have been used for classification. The results of the experiment prove that the proposed method is capable of achieving better levels of performance compared to existing methods like minimum redundancy maximum relevance, and correlation-based feature selection.

**Keywords:** Lung cancer · Small cell lung cancer (SCLC) · Non-small cell lung cancer (NSCLC) · Radiomic features · Gray level co-occurrence matrix (GLCM) · Gabor filter · Stochastic diffusion search (SDS) · Neural network (NN) · Naive Bayes and decision tree class SVM



## **An Exquisite Examination of Coverage, Deployment, and Localization Challenges in Wireless Sensor Networks Utilizing Artificial Intelligence Techniques: A Comprehensive Review.**

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### **ABSTRACT**

Abstract— The escalating significance and extensive integration of Wireless Sensor Network (WSN) technologies have significantly advanced the development of intelligent environments across diverse sectors, including manufacturing, smart cities, transportation, healthcare, and the Internet of Things, by facilitating ubiquitous real-time applications. In this paper, we delve into the prevailing research trends surrounding the challenges of Coverage, Deployment, and Localization in WSNs, particularly in relation to Artificial Intelligence (AI) methodologies aimed at enhancing WSN capabilities. We offer an in-depth examination of recent studies that have employed various AI techniques to achieve specific objectives within WSNs, spanning the years 2010 to 2021. This analysis serves to enlighten readers on the contemporary applications of AI methods addressing different WSN challenges. Furthermore, we present a thorough evaluation and comparison of the diverse AI approaches utilized in WSNs, providing invaluable insights for the research community in identifying the most suitable methods and the advantages of employing various AI strategies to tackle the Coverage, Deployment, and Localization challenges associated with WSNs. In conclusion, we outline the unresolved research issues and propose new avenues for future exploration.

**Key Words:** Artificial intelligence, coverage, deployment, Internet of Things, localization, wireless sensor networks.

## Detecting Spam messages in Short Message Service (SMS) using Machine Learning Techniques and NLP

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### ABSTRACT

Abstract— Short Message Service (SMS) is a kind of text message service available on mobile phones. Due to the increase in the number of mobile users, SMS traffic also increased drastically as a result of which the spam messages also increased. Hence the detection of spam messages has become a major issue in mobile communication due to which message communication via mobile phones is insecure. In order to provide a better solution to this issue a precise and accurate method is needed. Spam SMS messages are undesirable for receivers which can be dispatched to the customers without their earlier permission. Introduction of Spam SMS detection, will efficaciously remove the danger of private statistics like card details, username, password, etc. the proposed system uses machine learning- approaches to detect spams in SMS. The Spammers attempt to send junk mail or spam text messages for financial as well as business benefits like marketing, credit score card information, lottery ticket promotion, etc., hence special attention is required for the classification of spam. In the proposed system various Machine learning (ML) techniques are applied like Sas K-NN, SVM and Multinomial Naïve Bayes, accomplished 99% precision which is high as contrasted with other existing models by adding techniques such as the removal of stop words, punctuation, tokenization and lemmatization.

**Keywords:** SMS, Machine learnin, Naïve Base, KNN.

## Developing Deep Learning Models for NLP applications

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### ABSTRACT

Abstract— Deep Neural Network Architectures, such as RNNs, LSTMs, GRUs, and Transformers, are used to build deep learning models for Natural Language Processing (NLP) problems. So, if you want to learn how to build deep learning models for NLP, this article is for you. In this article, I'll take you through how to build deep learning models for NLP tasks with Python using examples like next word prediction and text generation. Text preprocessing is essential for deep learning models to perform well. Here's how we clean the text. Remove special characters and punctuation. Convert the text to lowercase. Replace multiple spaces with a single space. Deep Neural Network Architectures, such as RNNs, LSTMs, GRUs, and Transformers, are used to build deep learning models for Natural Language Processing (NLP) problems. I hope you liked this article on building deep learning models for NLP problems

**Keywords** – Word Prediction, Deep Learning.



## **5G Wireless Networks Meet Big Data Challenges, Trends and Applications**

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### **ABSTRACT**

Abstract— The next-generation (5G) wireless networks have been evolving into very complex systems due to the diversified service requirements, heterogeneity in applications, devices, and networks. The network operators need to make the best use of the available resources, for example, power, spectrum, infrastructures, as well as data. Large amounts of data, generated from the network and the subscribers, would dramatically help make the system smart and efficient by advanced exploiting. Besides, the synergy of the 5G and the big data would create new services, which promotes a faster digital transformation of the vertical industries. In this paper, we first present the evolution of the big data in the uprising 5G era. Then, an overview of the interplay between the 5G and the big data is provided. Following gives the discussion on challenges and trends of the development of 5G and big data. To further illustrate the benefits, data-driven services are studied. 5G wireless networks can facilitate the big data processing chain, and by the same token, telecom big data also has great potential in improving network performance and user experience. Telecom operators have attempted to employ data analytics to assist operate networks, which efficiently improve the network resources management, network investments, network construction strategy and users' experience.

**Keywords-** 5G, Big Data, IoT, Edge Computing, Artificial Intelligence

## **Hybrid Wavelet-Artificial Neural Network Based Intelligent Technique for Electric Load Forecasting**

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### **ABSTRACT**

Abstract— Load forecasting is one of the most important factors in power system planning and operation. To achieve higher profit margin, power companies required efficient and effective load forecasting. The limitations of traditional forecasting techniques have attracted the researchers to develop more precise and feasible techniques. With the introduction of artificial intelligent techniques, the possibility of obtaining accurate load forecasts increases This research paper proposes an intelligent forecasting technique for electric load based on hybrid Wavelet-Artificial Neural Network (W-ANN) integration. A comparative study was also performed on different Daubechies wavelets to achieve optimal solution.

**Keywords:** Wavelet Transform, Neural Networks, Load Forecasting, Power System, Soft Computing etc.

## Automated Admission with PSO search and Feature Selection using Decision Tree

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### ABSTRACT

Abstract— The normal way of admission in a college is tedious tasks to come to the college fill the admission form and submit it. In admission time many students also wait for admission and then the details have been updated into a system this is a long-time process because it covers a high amount of manual works to enter the data into a record and also takes much more time. Automated admission makes the admission of the students in a smart way. By this system, the student has entered the information. The portal contains different colleges. The college those who wish can register their details into the portal with their eligibility expectation of student. Then, at that point, the understudy has gone to the test in the gateway by utilizing AI procedure, the framework has observed the best school for the understudy and qualified understudy to the school given results. Finally, both students and colleges get notification about the admission.

**Keywords** – Machine Learning, Neural Network, Decision tree, PSO search.



## A Comprehensive Review of Recent Advances on Intelligence Algorithms and Information Engineering Applications

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**Abstract**— The advent of artificial intelligence (AI) has catalyzed transformative changes across diverse domains, establishing itself as a disruptive technology. Traditional methods often fall short in solving intricate information engineering problems, whereas AI methods can offer superior efficiency, speed, and accuracy. This paper provides a comprehensive overview of the research and practical applications of artificial intelligence in addressing information engineering challenges over the past two decades. It focuses on four critical information engineering fields: intelligent control, pattern recognition and intelligent systems, intelligent signal processing and communication, and optimization algorithms. This paper covers the backgrounds, driving forces, technologies, and applications of these fields, as well as the applications of AI in these areas. We believe that this study will be a valuable resource for both novice and seasoned researchers interested in leveraging AI to tackle information engineering challenges, offering a comprehensive understanding of AI integration and its potential in these areas. Explainable Artificial Intelligence: A Review and Case Study on Model-Agnostic Methods" provides a comprehensive overview of techniques designed to improve the interpretability and transparency of AI models. It focuses on model-agnostic methods, which are approaches that can be applied to any machine learning model without altering its internal structure.

**Keywords:** Artificial intelligence, neural networks, intelligent control, intelligent optimization social isolation, emotional connection, conversational AI, natural language processing (NLP), sentiment analysis.

## Explainable Artificial Intelligence: A Review and Case Study on Model-Agnostic Methods

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### ABSTRACT

Abstract— Explainable Artificial Intelligence (XAI) has emerged as an essential aspect of artificial intelligence (AI), aiming to impart transparency and interpretability to AI black-box models. With the recent rapid expansion of AI applications across diverse sectors, the need to explain and understand their outcomes becomes crucial, especially in critical domains. In this paper, we provide a comprehensive review of XAI techniques, emphasizing their methodologies, strengths, and potential limitations. Furthermore, we present a case study employing six model-agnostic XAI techniques, offering a comparative analysis of their effectiveness in explaining a black-box model related to a healthcare scenario. Our experiments not only showcase the applicability and distinctiveness of each technique but also provide insights to researchers and practitioners seeking suitable XAI methodologies for their projects. We conclude with a discussion on future research perspectives in the field of explainable AI.

**Keywords** – Explainable Artificial Intelligence, XAI, Model-Agnostic, Black-box, Interpretability

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St Martin's Engineering College ([www.smec.ac.in](http://www.smec.ac.in))

## Machine Learning for Predictive Maintenance in Industrial Systems

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### ABSTRACT

Abstract— Predictive maintenance (PdM) in industrial systems has emerged as a key strategy for minimizing downtime, reducing costs, and optimizing operational efficiency. Machine learning (ML) plays a pivotal role in enabling PdM by analyzing historical and real-time data to predict equipment failures and recommend timely maintenance actions. This paper provides a comprehensive overview of the use of ML techniques for predictive maintenance in industrial settings. It discusses various data sources, preprocessing methods, and feature extraction techniques critical for effective implementation. Key machine learning algorithms, including supervised, unsupervised, and deep learning approaches, are reviewed in the context of their application to PdM. The paper also highlights challenges such as data quality, scalability, and model interpretability, offering potential solutions and future research directions to address these issues. Case studies from different industries illustrate the practical applications and benefits of ML-driven PdM. Finally, the paper emphasizes the importance of integrating domain knowledge with ML techniques to achieve robust and reliable predictive maintenance solutions.

**Keywords:** Predictive maintenance (PdM), Machine learning (ML), Industrial systems, Equipment failure prediction, Supervised learning.



## AI Policy and Progress: Defining the Rules of the Game

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### ABSTRACT

Abstract— The rapid advancement of artificial intelligence (AI) presents immense opportunities for societal transformation but also poses significant challenges that demand thoughtful regulation and governance. This paper explores the necessity of a robust framework to define the "rules of the game" for AI development and deployment. It examines key areas of concern, including ethical considerations, transparency, accountability, safety, and the equitable distribution of AI's benefits. By analyzing current policies, industry best practices, and global regulatory efforts, the paper highlights gaps in existing frameworks and proposes principles for sustainable AI progress. Ultimately, it advocates for a collaborative, multi-stakeholder approach involving governments, private entities, academia, and civil society to ensure that AI advances responsibly, aligning technological innovation with human values.

**Keywords** – Artificial intelligence (AI), AI development, Transparency, Accountability

## From big data to multi-RAT cooperative energy-saving systems

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### ABSTRACT

Abstract— This paper explores the integration of Big Data analytics and Multi-RAT (Radio Access Technologies) in the development of energy-saving systems for modern telecommunications networks. As the demand for high-speed mobile data and connectivity increases, network operators are confronted with the dual challenge of reducing energy consumption while maintaining or improving service quality. By leveraging Big Data analytics, we propose a cooperative energy-saving framework that dynamically selects and coordinates multiple RATs (e.g., 4G, 5G, Wi-Fi) to optimize power usage based on real-time traffic demands, network load, and environmental conditions. Our approach incorporates machine learning techniques to predict traffic patterns and optimize energy efficiency at both the network and device levels. Experimental results demonstrate the potential of such systems to achieve significant. In this paper, we examine the integration of big data analytics with 5G networks and how the synergy between the two technologies is poised to reshape industries such as healthcare, manufacturing, transportation, and urban management. We explore the driving forces behind this integration, highlight key trends, and discuss the challenges that must be overcome to fully realize the potential of this convergence.

**Keywords** — Big Data, Multi-RAT, Energy Saving, Telecommunications, Machine Learning, Network Optimization, 5G, Green Networks, Sustainable Systems, Data Analytics.

## An Attention Mechanism and Grad-CAM Interpretability Deep Learning Approach for Automated Foot Type Identification

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### ABSTRACT

Abstract— Plantar pressure distribution is crucial for assessing foot function, diagnosing foot problems, and designing orthotics. Traditional machine learning approaches are limited in their capacity to capture complex spatial patterns and attain high accuracy due to their reliance on manual feature selection. The efficacy of these methods is subpar since they usually rely on manually selected variables and struggle to find intricate relationships in the plantar pressure data. Recently, hierarchical features in raw data may now be automatically identified thanks to machine learning algorithms. These methods can capture both local and global patterns, perform better at extracting complicated characteristics, and yield accurate classification results. Nevertheless, their inherent complexity often renders them uninterpretable.

**Keywords:** Machine learning algorithms, Deep learning technique, Automatically identified.



## Computer network-based intrusion detection system (IDS) classification

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### ABSTRACT

Abstract— Concern over cybersecurity, which aims to protect the system's data or communication technology, has grown in recent years as a result of the advent of the limitless communication paradigm and the rise in networked digital gadgets. Every day, new attack types are discovered by intruders; consequently, in order to stop these attacks, intrusion detection systems (IDSs) must first correctly identify them before appropriate responses can be provided. Data collection, feature selection/conversion, and decision engine are the three primary components of intrusion detection systems (IDSs), which are extremely important for network security. The last component has a direct impact on the system's efficiency, and one of the most promising study topics is the application of machine learning techniques. Lately, With its unique learning mechanism, deep learning has emerged as a novel technique that makes it possible to employ Big Data with a low training time and high accuracy rate. As a result, its application in IDS systems has begun. By conducting a literature review and providing background information on either intrusion detection systems or deep learning algorithms, this research aims to survey the deep learning-based approach to intrusion detection systems.

**Keywords:** Intrusion detection; Deep Learning; Security; Big Data.

# A Novel Approach to Optimizing Machine Learning Algorithms for Large-Scale Data Sets

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## ABSTRACT

Abstract— Machine learning (ML) has witnessed remarkable advancements, driven by the increasing availability of large-scale data. However, applying traditional ML algorithms to such massive datasets often results in computational inefficiencies, slow training times, and memory limitations. This paper presents a novel approach to optimizing machine learning algorithms by combining data pre-processing techniques with parallel computing strategies. Specifically, we introduce an adaptive hybrid framework that leverages both dimensionality reduction and parallelization to enhance the scalability and efficiency of ML models. The framework is tested on several well-known datasets, demonstrating significant reductions in computational time while maintaining or even improving model accuracy. Our results highlight the potential of integrating optimization strategies to tackle the challenges of big data in machine learning, providing a pathway for future research and development in this area.

**Keywords:** Machine Learning, Large-Scale Data, Dimensionality Reduction, Parallel Computing, Scalability, Optimization, Big Data

## **The Forecast of Energy Demand on Artificial Neural Network**

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### **ABSTRACT**

Abstract— Traditional method about forecast of energy demand, Trend Extrapolation, can't study the information supplied with date effectively, and BP neural network has the great power of goal learning, which can dig potential function in the date. The article design the GDP and other factors as input variables, and use steepest descent back propagation to adjust the weight and threshold of network. We choose the optimal number of hide layer via experimentation, and achieve the train and simulate of network with MATLAB. The final result shows that the forecast of neural network has much higher precision than the forecast of trend extrapolation. The article indicates that BP neural network has the higher precision.

**Keywords:** Energy demand forecast; Neural network; Nerve cell of hide layer



## Avoiding Child Abuse by Using Artificial Neural Networks as a Risk Assessment Tool

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### ABSTRACT

Abstract— The advantages of using neural network methodology for the modeling of complex social science data are demonstrated, and neural network analysis is applied to Washington State Child Protective Services risk assessment data. Neural network modeling of the association between social worker overall assessment of risk and the 37 separate risk factors from the State of Washington Risk Assessment Matrix is shown to provide case classification results superior to linear or logistic multiple regression. The improvement in case prediction and classification accuracy is attributed to the superiority of neural networks for modeling nonlinear relationships between interacting variables; in this respect the mathematical framework of neural networks is a better approximation to the actual process of human decision making than linear, main effects regression. The implications of this modeling advantage for evaluating social science data within the framework of ecological theories are discussed. (PsycINFO Database Record (c) 2016 APA, all rights reserved)

**Keywords:** Protective Services; Neural network, Classification accuracy.

## **Detection with Artificial Neural Networks**

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### **ABSTRACT**

Abstract— Applications for artificial neural networks are numerous and include categorisation, pattern recognition, and control. A digital electrical circuit with non-volatile memory can be used to achieve password detection, however this method is vulnerable to hacking. We have constructed, trained, and tested a three-layer feedforward neural network for secure password detection, which we present in this study. When a password entered into the network's inputs corresponds to the user ID that the network learnt during training, the network recognises it 100% of the time. Our neural network was trained, simulated, and tested using the BrainMaker and NetMaker programs. Additionally, our studies with increasing the number of hidden layers, hidden layer neurones, and noise additions are reported in the study. A crucial security component for accessing control panels, cabinets, electronic devices, doors, and other similar items is password-controlled access. It eliminates the need for more costly biometric equipment and frees workers from carrying actual keys. To gain access to the restricted area or equipment, one only needs to commit a username or ID number to memory along with a corresponding password. Usually, a keypad is needed to enter the user ID and password, non-volatile storage, like flash memory, to capture and store the matching combination of the user ID and password, and a controller to manage the password detection process. The passwords and user IDs that the user inputs using the keypad are Latched (L) and the committed to memory (password, user ID) be built on a single chip and just needs the network weights to be maintained, however it does not need the matching (password, user ID) combinations to be kept on external storage.

**Keywords: Key Words:** Secure password detection, feed forward artificial neural networks, back propagation training algorithm

## **Historical Data-Based Gold Price Prediction using Intelligent Algorithms**

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### **ABSTRACT**

Abstract— The price of gold keeps on changing either it increases or decreases. The predicting of the gold price is an important aspect in finance as gold is a leading component in financial market. Different papers have been published predicting gold prices using different machine-learning models. In this paper using different classification algorithms like random forest, decision tree, linear regression and logistic regression. The subject of this piece is originated on research done to comprehend relate to the value of gold. At present there is always a demand for gold. The trend in gold prices demonstrates that one of the finest investment strategies is gold. Predicting the direction of the gold rate is therefore wise. It is possible to model and forecast data using a variety of statistical models. The nonlinear character of the gold price is consistently apparent. For the right financial and investment strategies, price prediction is essential. An exponential curve can be used to represent the fluctuation in the gold price. One of the finest methods for resolving nonlinearities in data is convolutional neural networks, and RNNs are particularly effective for forecasting and estimating time series. The World Gold Council information is utilized, and the findings indicate that the proposed architecture is one of the best financial forecasting methods.

**Key Words:** Regression, linear regression, logistic regression, decision tree, random forest, Machine Learning and l Prediction



## **Artificial Intelligence in Computer Network Technology Applications**

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### **ABSTRACT**

Abstract— The field of computer network technology has seen a revolution thanks to artificial intelligence (AI), which has improved scalability, security, and efficiency. The application of AI to network administration, optimization, and security is examined in this research. Intelligent traffic routing, anomaly detection, automated network monitoring, and predictive maintenance are some of the key uses. Artificial Intelligence (AI) lowers operating costs, mitigates cyber threats, and facilitates real-time decision-making through the use of machine learning algorithms, neural networks, and natural language processing. The difficulties in putting AI into practice are highlighted in this abstract, including the requirement for reliable algorithms, scalability issues, and data protection issues. According to the report, artificial intelligence (AI) has the ability to completely transform computer network technology in the future by enabling self-configuring, self-healing, and self-optimizing systems.

**Key Words:** Artificial Intelligence, Computer Network Technology, Application.

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## **Question Answering System on Education Acts Using NLP Techniques**

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### **ABSTRACT**

Abstract— Question Answering (QA) system in information retrieval is a task of automatically answering a correct answer to the questions asked by human in natural language using either a pre-structured database or a collection of natural language documents. It presents only the requested information instead of searching full documents like search engine. As information in day to day life is increasing, so to retrieve the exact fragment of information even for a simple query requires large and expensive resources. This is the paper which describes the different methodology and implementation details of question answering system for general language and also proposes the closed domain QA System for handling documents related to education acts sections to retrieve more precise answers using NLP techniques.

**Key Words:** Question Answering, NLP, Information Retrieval, Education Acts.

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## **For an AI that is self-aware, socially conscious, and science-oriented: going beyond moral dilemmas**

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### **ABSTRACT**

Abstract— Are we prepared for the anthropological revolution based on artificially created mixed societies and intelligent technologies? This is also a revolution in politics, society, and the economy. A new universe, a new kind of civilisation and culture, and a new socio-cognitive-technical system are all being created by AI. It is a revolution in anthropology. "Social engineers" is what you are. Is our research on intelligent technology solely focused on business? AI ought to be more "scientifically orientated." Regarding the potential risks of AI, there is a prevalent, constrained viewpoint that focusses solely on moral dilemmas and on AI that is trustworthy, transparent, and explicable. In addition to being ethical, my query is political: who is being empowered by the AI revolution? AI has the potential to be highly significant "for freedom." Additionally, it might be innovative. "Technology of awareness." It can enhance not only individual and group intellect but also consciousness, which includes knowing what we are doing, why we are doing it, and who is "nudging" us.

**Key Words:** AI revolution, Ethical issues, Responsible AI..



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## **Software-Defined Networks and Machine Learning**

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### **ABSTRACT**

Abstract— Software defined networks, or SDNs, are a new type of network architecture that divides the control plane from the forwarding plane. This allows network administrators to define and manage the network using software programming, and it offers a fresh avenue for future network architecture research. Simultaneously, machine learning technology has advanced quickly in recent years, and some research has started integrating machine learning techniques into SDN to increase network management and conformance efficiency or to address issues that are difficult for conventional approaches to handle. In order to help future researchers better grasp SDN, the study analyzes, summarizes, and explains various studies that used supervised learning, unsupervised learning, or semi-supervised learning techniques to solve certain specific challenges.

**Key Words:** Machine Learning, Software Defined Network, SDN.

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## **An introduction to machine learning technologies and how they are used in online education**

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### **ABSTRACT**

Abstract— We generate an incredible amount of data because of new technology, the internet, and connected objects. It is crucial to organize and contextualize this data so that they can be seen, comprehended, and reflected. Data analysis has historically been done by humans. But as data volumes increase, people are increasingly turning to automated systems that can mimic them. Machine learning refers to those systems that can solve issues by learning from data and data changes. Research on e-learning is significantly impacted by artificial intelligence, and technology enhanced learning environments (TELE) can be improved by implementing machine learning-based techniques. An overview of current discoveries in this field of study is provided in this paper. We begin by outlining the fundamental ideas of machine learning.

**Key Words:** E-learning, Technology Enhanced Learning Environments, Data, Learners' traces, Machine Learning, Deep Learning

## Software Engineering Artificial Intelligence Methods for Automated Software Design and Reuse

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### ABSTRACT

Abstract—: Reusability of components in software development has been successfully achieved through the mining of software engineering data. A wide range of software engineering applications are enhanced by artificial intelligence. Data mining and artificial intelligence are combined in intelligent knowledge discovery to compute software engineering tasks intelligently. Software intelligence is the result of combining data mining and artificial intelligence to support software engineering applications. This study examines three artificial intelligence approaches that support automated software reuse for software construction and general software development through the use of data mining, business intelligence, and machine learning. Code that will be utilized for application and component reusability is intelligently discovered using business intelligence tools. A review of various AI approaches in the software engineering field of software reuse is included for automated identifying possible research opportunities in the field and reusing software

**Key Words:** Artificial Intelligence (AI), Software Intelligence (SI), Business Intelligence (BI), and Software Re



## Revolutionizing Epilepsy Diagnosis: Advances in Deep Learning for Automated Seizure Detection

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### ABSTRACT

Abstract—: This study introduces an innovative methodology for detecting epileptic seizures using Machine Learning (ML) and Deep Learning (DL) techniques applied to EEG signals. Epileptic seizures, marked by distinct patterns in Electroencephalography (EEG), present significant opportunities for advanced computational analysis. ML and DL algorithms have proven highly effective for feature extraction and classification in EEG signal analysis. Previous research often focused on transforming EEG signals into images or extracting time-frequency domain features for classification. In contrast, this work emphasizes direct classification of time-series EEG data using optimized machine learning classifiers and a One-Dimensional Convolutional Neural Network (1D CNN). The objective of this study is twofold: to identify an optimal classification framework and to evaluate critical performance metrics such as sensitivity, precision, and accuracy, which are vital in medical diagnostics and early intervention strategies. The UCI Epileptic Seizure Recognition dataset, comprising preprocessed time-series EEG data, is utilized for model development. Comparative analysis highlights the efficacy of various approaches, including machine learning classifiers and deep learning models. Results demonstrate that the proposed 1D CNN architecture outperforms conventional models, showcasing superior performance in terms of accuracy, precision, and sensitivity, thus underscoring its potential for reliable epileptic seizure detection.

**Key Words:** MRI and EEG Modalities, Deep Learning Applications, Automated Feature Extraction, Medical Imaging, Cloud-Based Diagnosis.

## ADAPTIVE LEARNING THROUGH AI: PERSONALIZED EDUCATION FOR CHILDREN WITH LEARNING DISABILITIES

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### ABSTRACT

Abstract—: In conventional educational environments, children with learning disabilities frequently face significant obstacles when standardized methodologies are unable to accommodate their unique needs. Children with learning difficulties frequently encounter considerable challenges in typical educational settings, when standardized approaches fail to meet their individual requirements. Adaptive learning, powered by artificial intelligence (AI), provides a novel solution by personalizing learning experiences based on each student's strengths and problems. This study examines the basics of adaptive learning, the role of artificial intelligence in customizing education, and its transforming influence on children with learning difficulties. We showcase the promise of AI-driven education in encouraging diversity, independence, and academic achievement by using real-world applications, case studies, and a discussion of obstacles and ethical issues. Adaptive learning using Artificial Intelligence (AI) is transforming education, especially for children with learning difficulties. Machine learning algorithms to analyze individual learning styles, abilities, and obstacles, offering individualized information and pacing for maximum understanding and engagement. Adaptive frameworks not only detect knowledge gaps, but also offer focused solutions to provide a helpful and inclusive learning environment. Real-time feedback, dynamic curriculum modifications, and increased motivation are among the key benefits of gamified and interactive courses.

**Key Words:** Artificial Intelligence, Personalized Education, Learning Disabilities, Adaptive learning.

## **HYBRID CONVOLUTION NEURAL NETWORK (CGAN) FOR PLANT LEAF DISEASE DETECTION WITH OTSU AND SURF FEATURE EXTRACTION**

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Abstract—For most people, farming is both a livelihood and a way of life. In most parts of the world, farming is central to cultural practices and customs. More efficient use of time and resources, as well as increased profitability, could be possible in the agricultural sector with the application of modern farming techniques. An innovative framework for plant leaf disease classification is provided by the proposed CGANmodel, which combines OTSU and SURF. One method for improving and preparing images in the CGANmodel is the contrast-limited adaptive histogram equalisation. The SURF technique uses scale-invariant feature transformation to extract local features, while the OTSU algorithm speeds up picture segmentation without previous knowledge of the pictures. These algorithms are employed by the suggested model. By employing an image-generation technique, CGAN expands the input plant village dataset, which it then uses to detect and categorise a wide range of plant leaf diseases. Fungal, viral, and bacterial illnesses are the three main types of leaf diseases. More than 300 illnesses are included in these categories. Out of 18,161 different crop species, both major and small, at least 200 illnesses were found in the suggested study. Researchers use the Python Jupyter program in conjunction with the Kaggle Plant Village Dataset and farmer-collected leaf samples to conduct their study. With the suggested framework, we reach an accuracy rate of 99.2%.

**Key Words:** CLAHE, SURF, GANs, OTSU, Disease classification, Deep learning.



## **Detection of Associations Between Asthma and Air Pollution in Urban Regions using Supervised Learning Algorithms**

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Abstract— Traffic and power generation are the main sources of urban air pollution. The idea that outdoor air pollution can cause exacerbations of pre-existing asthma is supported by an evidence base that has been accumulating for several decades, with several studies suggesting a contribution to new-onset asthma as well. In this Series paper, we discuss the effects of particulate matter (PM), gaseous pollutants (ozone, nitrogen dioxide, and Sulphur dioxide), and mixed traffic-related air pollution. We focus on clinical studies, both epidemiological and experimental, published in the previous 5 years. From a mechanistic perspective, air pollutants probably cause oxidative injury to the airways, leading to inflammation, remodeling, and increased risk of sensitization. Although several pollutants have been linked to new-onset asthma, the strength of the evidence is variable. We also discuss clinical implications, policy issues, and research gaps relevant to air pollution and asthma.

**Key Words:** Air pollution, Asthma prediction, Supervised learning, light gradient boosting model.

## **A Hopfield Neural Networks in Identification of Redistribution Energy based Load Balancing**

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Abstract— This work involves the application of multilayer Hop field neural network and dynamic neural network for the load frequency control of two-area power systems. Energy efficient wireless networks is the primary research goal for evolving billion device applications like IoT, smart grids and CPS. Monitoring of multiple physical events using sensors and data collection at central gateways is the general architecture followed by most commercial, residential and test bed implementations. Most of the events monitored at regular intervals are largely redundant/minor variations leading to large wastage of data storage resources in big data servers and communication energy at relay and sensor nodes. In this project a novel architecture of Hopfield Neural Network (NN) based day ahead steady state forecasting engine is implemented at the gateway using historical database. Gateway generates an optimal transmit schedules based on NN outputs thereby reducing the redundant sensor data when there is minor variations in the respective predicted sensor estimates. It is observed that NN based load forecasting for power monitoring system predicts load with less than 3% Mean Absolute Percentage Error (MAPE). Gateway forward transmit schedules to all power sensing nodes day ahead to reduce sensor and relay nodes communication energy.

**Key Words:** Hope Field Neural Network, Absolute Percentage, Sensor.

## Advancing Pulmonary Nodule Detection: A Deep Learning Perspective on CT Imaging

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### ABSTRACT

Abstract—: Lung cancer remains one of the most rapidly growing malignant diseases, posing a severe threat to public health due to its high morbidity and mortality rates. Early detection is critical, and CT imaging has proven effective in identifying lung cancer in its initial stages, often manifesting as pulmonary nodules. Low-Dose Computed Tomography (LDCT) has further enhanced the precision of detecting and classifying lung nodules, significantly reducing mortality rates. While radiologists play a key role in identifying lung nodules through image analysis, the growing demand and limited availability of specialists make manual assessments challenging. The increasing volume of CT data underscores the importance of employing efficient Computer-Assisted Detection (CAD) systems to automate the analysis of lung nodules. Convolutional Neural Networks (CNNs) have shown remarkable promise in facilitating early detection and management of lung cancer. This study reviews current methods for automated lung nodule detection, detailing experimental benchmarks and utilizing publicly available lung CT image datasets. Furthermore, it explores emerging research trends, challenges, and future directions in this field. The findings highlight the transformative impact of CNNs on early lung cancer diagnosis and treatment, offering valuable insights for medical research communities to enhance healthcare systems through advanced AI-driven methodologies.

**Key Words:** Lung Cancer Detection, Pulmonary Nodule Classification, Convolutional Neural Networks (CNNs), Computer-Assisted Detection (CAD) Systems.



## ABOUT CONFERENCE

The 2<sup>nd</sup> International Conference on “Innovations and Emerging Trends in Artificial Intelligence and Machine Learning Applications” (ICIETAIML’24) will be organized by Department of CSE (AI & ML), St. Martin’s Engineering College, Secunderabad, Telangana, India on 17<sup>th</sup> & 18<sup>th</sup> December 2024. ICIETAIML-24 will serve as a colloquy for sharing the proficiency among academicians, researchers, scientist and industrial personnel from all over the world in the areas of engineering and technology.



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