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- NIRF ranked 51–100
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- Ranked 2nd by 'Wikipedia'
- Ranked TOP by Competition Success Review
- 12886 Research papers
- 594 crores funding received
- 108 MOUs
- 288 patents

Department of *Computer Science and Engineering (AI & ML)* Presents *1st International Conference on*

"Innovations and Emerging Trends in Artificial Intelligence and Machine Learning Applications" on 15th & 16th December 2023

(ICIETAIML - 23) PROCEEDINGS

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Editor in Chief
Dr.P.Santosh Kumar Patra

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Department of Computer Science and Engineering (AI&ML)

1st "International Conference on Innovations and Emerging Trends in Artificial Intelligence and Machine Learning Applications"(ICIETAIML-23)

Organized on 15th & 16th December, 2023

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Editor in Chief

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Group Director, SMEC

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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 **1st "International Conference on Innovations and Emerging Trends in Artificial Intelligence and Machine Learning Applications"(ICIETAIML-23)** on 15th and 16th of December 2023. 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.

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 **1st "International Conference on Innovations and Emerging Trends in Artificial Intelligence and Machine Learning Applications"(ICIETAIML-23)** organized by the Department of Computer Science and Engineering (AI&ML) on 15th and 16th of December 2023. For strengthening the "MAKE IN INDIA" concept many innovations need to be translated in to workable product. Concept bcommissioning 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 paperson 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.

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 **1st "International Conference on Innovations and Emerging Trends in Artificial Intelligence and Machine Learning Applications" (ICIETAIML-23)** organized by the Department of Computer Science and Engineering (AI&ML) on 15th and 16th of December 2023. 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 100 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 100 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 1ST International Conference on Innovations and Emerging Trends in Artificial Intelligence and Machine Learning Applications -2023 (**ICIETAIML-2023**)" on 15th and 16th of December 2023 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 **1st "International Conference on Innovations and Emerging Trends in Artificial Intelligence and Machine Learning Applications"(ICIETAIML-23)** organized by the Department of Computer Science and Engineering (AI&ML) on 15th and 16th of December 2023. 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 **1st "International Conference on Innovations and Emerging Trends in Artificial Intelligence and Machine Learning Applications"(ICIETAIML-23)** organized by the Department of Computer Science and Engineering (AI&ML) on 15th and 16th of December 2023 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 -2023 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. K. Srinivas
Associate 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 the **1st "International Conference on Innovations and Emerging Trends in Artificial Intelligence and Machine Learning Applications"(ICIETAIML-23)** organized by the Department of Computer Science and Engineering (AI&ML) on 15th and 16th of December 2023, 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, whichwill ultimately benefit the larger society of India.

We, the organizers of the conference are glad to note that more than 100 papers have been received for presentation during the online conference. After scrutiny by specialist 0 papers have been selected, and the authors have been informed to be there at the online platform for presentations. Steps have been 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 delightedand happy to state that the conference is moving towards a grand success with the untiring effortof 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.

Dr. K. Srinivas.
HOD – CSE (AI & ML)

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Machine Learning for Classification of Stars, Galaxies Through Exploring the SDSS Space Observation Dataset

[1]Avinash Kuppam, [2]KunapareddyShanthi, [3]Chintha Neha, [4]Teeda Yogeshajay, [5]Dr. K. Srinivas

[1234]UG Scholar, [5] Associate Professor,
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail:avinashkuppam@gmail.com

ABSTRACT

Abstract—The Sloan Digital Sky Survey (SDSS) stands as a monumental astronomical survey, providing an extensive dataset on stars and galaxies essential for decoding the mysteries of the universe. Manual analysis of this vast dataset is impractical due to its scale, leading to the adoption of Machine Learning (ML) for automating the classification process. In this research, a ML system is proposed, utilizing labelled data to achieve precise and efficient classification of celestial objects. State-of-the-art algorithms demonstrate superior accuracy over traditional methods, offering a time-efficient tool for large-scale sky surveys. This technological advancement represents a significant contribution to our understanding of celestial objects, facilitating a streamlined analysis of astronomical data. The proposed ML system not only enhances efficiency in classification but also contributes to the broader exploration of the universe. By leveraging rich features and information within the SDSS dataset, this research marks a pivotal step in advancing astronomical research methodologies and technologies.

Keywords: Sloan Digital Sky Survey, Astronomical data, Machine Learning, Classification, Celestial Objects, Large-Scale Surveys.

Deep Learning-Based Categorization of Female Face-Shapes Using the HOORS Dataset

[1]**Puritipati Praveen Reddy,** [2]**Devarapally Koushik,** [3]**Nimmala Bhavani,** [4]**Parvathi Roshini,** [5]**Dr. G. Govinda Rajulu**
[1234]UG Scholar, [5] Professor,
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail:puritipatipraveen@gmail.com

ABSTRACT

Abstract—Facial feature understanding and face-shape categorization are pivotal in computer vision and facial recognition applications, facilitating personalized cosmetic recommendations, augmented reality filters, and facial feature analysis. An accurate and automated face-shape classification system is increasingly essential for meeting the demand for personalized products and services. This research proposes a deep learning-based approach for categorizing female face-shapes using the HOORS dataset. The system aims to automate classification by leveraging deep neural networks, which have shown promise in capturing intricate facial patterns. The proposed deep learning system is anticipated to outperform traditional methods, providing a more accurate and efficient solution. Precise female face-shape categorization has practical applications, including personalized beauty product recommendations, virtual makeup try-on, and facial feature analysis for healthcare and biometric identification.

Keywords: Face-shape classification, deep learning, computer vision, facial recognition, HOORS dataset,augmented reality, facial feature analysis, automated system.

Predicting Dissolved Oxygen Levels in River Water Using Machine Learning

[1]D. Santhosh Kumar, [2]B. Aishwarya, [3]R. Sathvik, [4]B. Anokhi, [5]P. Mahesh
[1234]UG Scholar, [5] Assistant Professor,
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail:durgamsanthosh70@gmail.com

ABSTRACT

Abstract— Monitoring and predicting dissolved oxygen (DO) levels in river water is crucial for assessing the health of ecosystems and ensuring the survival of aquatic life. The traditional approach, involving manual collection of water samples and laboratory analysis, has limitations such as spatial and temporal constraints, leading to gaps in data and hindering real-time monitoring. This method is also time-consuming, costly, and has limited coverage. In response to these challenges, there is a growing demand for more efficient and accurate techniques. This research proposes a machine learning (ML)-based approach to predict DO levels by analyzing historical and real-time data. ML's ability to identify complex patterns in vast datasets offers a promising solution. The envisioned predictive model aims to provide continuous and reliable DO level predictions, contributing to improved environmental management, effective conservation efforts, and sustainable water resource planning. Accurate predictions are essential for maintaining suitable DO levels, ultimately supporting the overall well-being of river ecosystems.

Keywords: Dissolved Oxygen, Machine Learning, Vast Datasets, Ecosystem, Respiration, Prediction, Real-Time Data.

Image Based Multi-Class Classification of Weather Conditions Using Machine Learning

[1]Amirineni Angel Mary Poulina,[2]Maddula Vineeth Reddy, [3]Telange Shraddha Anant, [4]Vadde Yuvaraj, [5]Mr. J. Venkatarangan
[1234]UG Scholar, [5] Assistant Professor,
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail: angelmarypoulina@gmail.com

ABSTRACT

Abstract— Monitoring and predicting dissolved oxygen (DO) levels in river water is crucial for assessing the health of ecosystems and ensuring the survival of aquatic life. The traditional approach, involving manual collection of water samples and laboratory analysis, has limitations such as spatial and temporal constraints, leading to gaps in data and hindering real-time monitoring. This method is also time-consuming, costly, and has limited coverage. In response to these challenges, there is a growing demand for more efficient and accurate techniques. This research proposes a machine learning (ML)-based approach to predict DO levels by analyzing historical and real-time data. ML's ability to identify complex patterns in vast datasets offers a promising solution. The envisioned predictive model aims to provide continuous and reliable DO level predictions, contributing to improved environmental management, effective conservation efforts, and sustainable water resource planning. Accurate predictions are essential for maintaining suitable DO levels, ultimately supporting the overall well-being of river ecosystems.

Keywords: Dissolved Oxygen, Machine Learning, Vast Datasets, Ecosystem, Respiration, Prediction, Real-Time Data.

The Impact of Artificial Intelligence on Forecasting Startup Success or Failure using Crunchbase Data

[1]Bashetti Pavan Kumar, [2]Meeripelly Sanjana, [3]Santoshi Kammari, [4]Bandaru Sathwik, [5]Dr. K. Srinivas

[1234]UG Scholar, [5] Associate Professor,
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail: pavanbangaram06063@gmail.com

ABSTRACT

Abstract— Startups, integral for innovation and economic growth, often face challenges leading to a substantial failure rate. Traditional methods of forecasting success rely on historical financial data, market analysis, and subjective evaluations, but they exhibit scalability limitations, human biases, and struggle with diverse data. This compromises accuracy, impacting identification of potential successes or prevention of investment in failing ventures. Accurate startup success prediction is crucial for investors, entrepreneurs, and policymakers. Artificial Intelligence (AI) mitigates risks in early-stage investments by identifying high-potential startups. Entrepreneurs benefit from AI-driven forecasting, aiding viability assessment and strategy refinement. Policymakers can use AI insights for effective support programs, fostering a thriving startup ecosystem. This project utilizes AI to predict startup success by analysing data from Crunchbase, emphasizing AI's potential benefits for all stakeholders. By processing vast data, including social media trends, AI enhances decision-making, revolutionizing startup forecasting for a competitive landscape.

Keywords: Crunchbase, accuracy, forecasting, aiding viability.

AI-Based Feature Selection with Unsupervised learning for Efficient Spam & Phishing Email Classification

[1]Aryan Yadav, [2]Nambu Abhiram, [3]Nimma Surya Tejas Reddy, [4]Rohit Srinivas Shibineni,[5]Mr. D. Venkatesan
[1234]UG Scholar, [5] Assistant Professor,
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail: yadavaryankumar2003@gmail.com

ABSTRACT

Abstract— Email has become one of the most important forms of communication. In 2014, there are estimated to be 4.1 billion email accounts worldwide, and about 196 billion emails are sent each day worldwide. Spam is one of the major threats posed to email users. In 2013, 69.6% of all email flows were spam. Links in spam emails may lead to users to websites with malware or phishing schemes, which can access and disrupt the receiver's computer system. Therefore, an effective spam filtering technology is a significant contribution to the sustainability of the cyberspace and to our society. This project employs artificial neural networks to detect SPAM, HAM, and Phishing emails by applying features selection algorithm called PCA (principal component analysis). All existing algorithms detected only SPAM and HAM emails, but proposed algorithm designed to detect 3 different classes called SPAM, HAM, and Phishing. To implement this project, we have combined three different datasets called UCI, CSDMC and SPAM ASSASSIN dataset, where UCI and CSDMC datasets provided SPAM and HAM emails and Spam Assassin dataset provided Phishing emails. All these emails were processed to extract important features used in spam and phishing emails such as JAVA SCRIPTS, HTML tags and other alluring URLS to attract users.

Keywords: Datasets, Spam, Phishing, cyberspace.

Machine Learning based Crop Recommendation System for Enhanced Yield Production

[1]Cheri Anush Kumar, [2]Chinthalapati Abhishek Varma, [3]Putta Akhil,[4]Ramanathi Dharma Teja,
[5]N. Radhamma

[1234]UG Scholar, [5] Assistant Professor,
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail: [1]anushkumarcheri@gmail.com

ABSTRACT

Abstract—Agriculture plays a critical role in ensuring that there is enough food to feed our ever-growing global population. With the challenges posed by climate change and its uncertainties, it has become increasingly important to adopt sustainable practices in agriculture. One crucial aspect of this is optimizing how we use our land, water resources, and fertilizers while also increasing crop yields. Traditionally, farmers relied on their own experience, local knowledge, and trial-and-error methods to decide which crops to grow in their specific regions and soil types. Unfortunately, this subjective approach often led to uncertainties, reduced productivity, and economic losses. Inappropriate crop choices were also common, resulting in suboptimal yields and wasted resources. To address these issues, we are working on developing a Machine Learning-based Crop Recommendation System.

Keywords: suboptimal, climate change, water resources.

Environmental Condition Monitoring Using AI Models Form IOT Sensor Telemetry Data

[1]Munagala Sree Lekha, [2]Gorighe Indra Sena, [3]Patlolla Harini, [4]Gurrala Dheeraj, [5]Mrs. G. Priyanka

[1234]UG Scholar, [5] Assistant Professor,
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail: sreelekha2729@gmail.com

ABSTRACT

Abstract—The increasing concern surrounding environmental degradation and its impact on both human health and ecosystems has made it crucial to have accurate and real-time environmental condition monitoring systems in place. In the past, monitoring the environment involved setting up sensors at specific locations to measure various parameters like air quality, temperature, humidity, water quality, and noise levels. The data collected from these sensors would then be sent to a central database for manual analysis and interpretation. However, this traditional approach had its limitations, including delays in responsiveness, issues with scalability, and difficulties in processing vast amounts of data efficiently. The emergence of Internet of Things (IoT) technology, combined with advancements in Artificial Intelligence (AI) modeling, offers exciting opportunities to transform environmental monitoring. This project aims to create an innovative environmental condition monitoring system that leverages the capabilities of IoT sensor telemetry data and AI models.

Keywords: Degradation, accurate, interpretation, scalability.

Predicting Surgery Outcome: Binary Classification Based on Patient Factors and Medical Data

[1]Pallemeedi Vihari, [2]Raja Akhila, [3]Sunkari Rama Rajeswari, [4]Kandhi Rakesh, [5]Mrs.Gnana Prasana

[1234]UG Scholar, [5] Assistant Professor,
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail: pvihari02@gmail.com

ABSTRACT

Abstract— Surgery is a critical medical procedure that carries inherent risks and complications. The success of a surgical intervention depends on various factors, including the patient's health status, medical history, and other pre-operative information. Predicting the outcome of a surgery can help medical professionals make informed decisions, optimize treatment plans, and improve patient care. This project aims to revolutionize surgical care by leveraging machine learning and patient data to develop a binary classification model predicting surgery outcomes. By analyzing diverse patient factors and medical records, the model will distinguish between successful surgeries and those with complications. This data-driven approach enhances decision-making, reduces risks, and ultimately improves patient safety, offering a transformative tool for healthcare professionals

Keywords: medical Surgery, Patient Factors, Machine Learning, Binary Classification, Decision Making, Large-Scale Surveys.

Ml Application: Detecting Window Open Events in Smart Homes Using Temperature Sensor Data

[1]Shanigaram Lohitha, [2]Vallakonda Shroumitha, [3]Anmol Elizer, [4]Singareddy Hemanth, [5]T. Kanakamma

[1234]UG Scholar, [5] Assistant Professor,
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail: reddylohitha06@gmail.com

ABSTRACT

Abstract— Smart homes have seen a surge in popularity, thanks to the integration of Internet of Things (IoT) devices that aim to enhance the comfort and energy efficiency of residents. A key aspect of these smart homes is the automated control of devices based on contextual information, such as whether windows are open or closed. Detecting window open events is crucial for optimizing heating, cooling, and ventilation systems, leading to substantial energy savings and improved user comfort. In traditional approaches, simple rule-based algorithms or threshold-based techniques have been used to identify window open events. For instance, a specific threshold on temperature differences between indoor and outdoor readings might be set to determine if a window is open. However, these methods often lack accuracy and robustness in real-world situations with varying conditions. To tackle this challenge, our work proposes a machine learning (ML)-based approach that capitalizes on temperature sensor data to detect window open events in smart homes. By training advanced ML models on a diverse dataset collected from various real-world scenarios, our application learns to identify intricate patterns that indicate the state of windows. As a result, the ML models can accurately distinguish between open and closed windows, offering precise information for automated control systems. The significance of our approach lies in its potential to significantly enhance energy efficiency, resulting in reduced utility costs and a more comfortable living environment in smart homes. Additionally, by promoting sustainable energy practices, our ML application contributes to environmental conservation, aligning perfectly with the growing global emphasis on eco-friendly living.

Keywords: accuracy, robustness, efficiency, environment conservation.

Predicting Fire Alarms Using Multi-Sensor Data: A Binary Classification Approach

[1]Kande Rakesh, [2]Avula Sudheer, [3] Godera Ganesh, [4]Karrolla Mahesh, [5]Dr. K. Srinivas

[1234]UG Scholar, [5] Associate Professor,
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail: rakeshkande5@gmail.com,

ABSTRACT

Abstract— Fires pose significant threats to human life, property, and the environment. Early detection of fire incidents is crucial to prevent extensive damage and to ensure the safety of occupants. Traditional fire alarm systems typically rely on a single type of sensor, such as smoke detectors or heat sensors, to detect specific fire indicators. These systems operate based on predefined thresholds and triggers. However, they can be prone to false alarms triggered by non-fire-related events (e.g., cooking fumes or dust) and may not provide early warning signs in certain scenarios. To address these limitations, researchers and engineers have turned to advanced technologies, such as multisensor data analysis and machine learning algorithms, to develop more reliable and efficient fire alarm prediction systems. On the other hand, the need for a more robust and accurate fire alarm prediction system stems from the shortcomings of traditional methods. False alarms not only lead to wasted resources but also desensitize occupants, potentially leading them to ignore genuine alarms. Additionally, a delayed response to a fire incident can result in severe consequences, making it essential to develop an intelligent system that can effectively and timely predict fire events. Therefore, this work presents the utilization of multi-sensor data and binary classification to develop a more reliable fire alarm prediction system. The experiments are conducted using a dataset collected from various sensor inputs, including air temperature, humidity, CO_2 concentration, molecular hydrogen, ethanol gas, and air pressure etc. Then applied binary classification algorithm to learn patterns from the data and classify fire-related events accurately. The results showed promising improvements in prediction accuracy, reduced false alarm rates, and early detection of fire incidents

Keywords: multisensory, thresholds, triggers and binary classification.

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Automated Star Type Classification with Machine Learning using NASA Data

[1]N. Sanjay, [2]K. Guna preeth, [3]T. Sai Teja, [4]N. Avinash, [5]N. Radhamma

[1234]UG Scholar, [5] Assistant Professor,
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail: gunapreeth008@gmail.com

ABSTRACT

Abstract— The star type classification has significant applications in astrophysical research and space exploration. Understanding different star types aids in analyzing the evolution and lifecycles of stars, studying their physical properties, and identifying celestial objects' characteristics across the universe. Accurate star type prediction can contribute to cosmological studies, stellar evolution modeling, and refining the Hertzsprung-Russell diagram. Additionally, this classification can support spacecraft missions, telescope observations, and astronomical surveys by automating star categorization. Several existing methods for star type classification include traditional statistical approaches, decision trees. While these methods achieve lower accuracy, they often struggle with complex and nonlinear relationships in the data. Moreover, they fail to leverage the full potential of the available features, leading to suboptimal performance and limited generalization to unseen star types. Additionally, manual feature engineering in traditional methods may become cumbersome when dealing with vast astronomical datasets. So, this work considers essential features like temperature, luminosity, radius, magnitude, color, spectral class, and the respective star type labels, encompassing Red Dwarf, Brown Dwarf,White Dwarf, Main Sequence, Super Giants, and Hyper Giants. In this study, we present a comprehensive analysis of various machine learning (ML) models for star type prediction and propose an improved approach to enhance accuracy and efficiency.

Keywords: Keywords Astrophysical, research Space exploration, Stella revolution, Hertzsprung Russell, diagram, Cosmological studies, Machine learning models, Decision trees.

ML-Driven Waste Classification for Effective Organic and Non-Organic Waste Management

[1]Aryan Reddy, [2]Nayan Reddy Soma, [3]Vasu Vardhan Akash, [4]Greeshma Reddy, [5]Dr. K. Srinivas

[1234]UG Scholar, [5] Associate Professor,
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail:aryanreddygoka@gmail.com

ABSTRACT

Abstract— Smart Waste Collection system can be developed by optimizing waste collection routes based on real-time waste classification and reducing operational costs. Accurate waste classification enables efficient recycling practices by diverting organic waste for composting and converting non-organic waste into recyclable materials. Proper waste classification helps prevent the contamination of soil, water bodies, and air, reducing the adverse environmental impacts of mismanaged waste. By segregating organic waste for composting, valuable nutrients can be returned to the soil, promoting sustainable agriculture and conserving resources.Conventional waste classification methods often rely on manual sorting or basic rule-based systems, which are labor-intensive, time-consuming, and error-prone. Human involvement in the sorting process can lead to inconsistencies and variations in waste categorization. Rule-based systems lack the ability to handle complex and diverse waste compositions, leading to suboptimal accuracy, especially in cases of mixed waste. Moreover, these methods might not be scalable or adaptable to handle large-scale waste classification demands in urban areas.The proposed machine learning (ML)-driven waste classification system leverages the power of AI algorithms to automate and improve the waste classification process. The system employs image analysis techniques to extract visual features from waste images, such as color, texture, and shape.

Keywords: Waste management, Image based classification, Machine Learning, Classification, organic waste, non-organic waste.

Advancement In ECG Ailment Multi-Class Classification Machine Learning: Approaches for Heart Health Diagnosis

[1]Shaik Kaif Nawaz, [2]Sana Sadab, [3]Tummalapally Sareen, [4]Mohammed Sameed, [5]Mr. D. Venkatesan
[1234]UG Scholar, [5] Assistant Professor,
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail: sanasadab01@gmail.com

ABSTRACT

Abstract— Electrocardiogram (ECG) ailment classification is a critical task in cardiac health diagnosis, aimed at identifying various heart-related abnormalities from ECG signals. ECG ailment multi-class classification has significant applications in cardiology and healthcare. It plays a crucial role in early detection and diagnosis of various cardiac conditions, including arrhythmias, myocardial infarctions, and heart blocks. Traditional ECG ailment classification methods often rely on handcrafted features and statistical measures extracted from the ECG signals. While these methods have been used successfully for some ailments, they may struggle to capture complex and subtle patterns indicative of certain cardiac abnormalities. This research explores the integration of machine learning algorithm in the domain of heart health diagnosis. To overcome the limitations of existing system, enhancing diagnostic accuracy and identifying subtle patterns indicative of heart condition.

 Keywords: Waste management, Image based classification, Machine Learning, Classification, organic waste, Non-organic waste.

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

Predictive Modeling Approach for Sleep Disorder using Sleep Health and Lifestyle Properties

[1]**Adla Rashmitha Sree, **[2]**Gundla Akshitha, **[3]**Vanjari Jahnavi, **[4]**Dr. K. Srinivas**
[1234]UG Scholar, [5] Associate Professor,
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail: rashmithareddy216@gmail.com

ABSTRACT

Abstract— In this groundbreaking study, we present a sophisticated predictive modeling framework designed to unravel the complex dynamics of sleep disorders. Focusing on an exhaustive array of sleep health and lifestyle parameters, our research aims to transcend traditional approaches by integrating cutting-edge machine learning methodologies. Through the meticulous analysis of extensive datasets capturing diverse facets of individuals' sleep patterns, daily routines, and health habits, we endeavor to unearth intricate patterns and correlations. This comprehensive exploration not only endeavors to accurately predict the occurrence of sleep disorders but also seeks to provide nuanced insights into the multifaceted interplay between various factors. The culmination of our efforts promises not only to advance the understanding of sleep health but also to pave the way for personalized interventions and proactive management strategies, ultimately contributing to the enhancement of overall well-being.

Keywords— Predictive modeling, Sleep disorders, Machine Learning, Lifestyle properties, Sleep patterns, Correlation analysis, Advanced analytics.

Fault Detection and Classification in Robotic Manipulator Tasks using Multi Class Classification

1 Madala Jaya Vignesh Gopi, 2Bollepalli Sai Praveen, 3Katike Pranay,4Mrs. G. Priyanka

1234UG Scholar, 5 Assistant Professor,
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail :vigneshgopi74@gmail.com,

ABSTRACT

Abstract— Robotic manipulators play a vital role in modern industrial automation, and ensuring their reliable performance is crucial for achieving efficient and safe operations. Fault detection and classification in robotic manipulator tasks are essential to identify anomalies and prevent potential failures that could lead to hazardous situations or costly production errors. By analysing force and torque measurements, these systems can identify different types of failures occurring during critical phases of robotic operations. Traditional fault detection and classification methods often rely on manual thresholding, statistical analysis, or heuristic rules. These approaches may struggle to handle complex and dynamic variations in force and torque data, limiting their ability to detect subtle failures or adapt to changing conditions. Additionally, manual feature engineering in these methods might not fully capture the relevant patterns, and their performance can be affected by noisy data or uncertainties associated with realworld robotic manipulator tasks. Furthermore, single-class classification methods may struggle to distinguish between multiple types of failures, leading to limited accuracy and incomplete fault diagnosis. In this research, we propose a multi-class classification approach for fault detection and classification in robotic manipulator tasks using the provided force and torque measurements. By training the model, each representing a different learning problem (LP1 to LP5), the system can effectively learn to differentiate between distinct types of failures. Here, LP1 indicates failures in approach to grasp position, LP2 indicates failures in transfer of a part, LP3 indicates position of part after a transfer failure, LP4 indicates failures in approach to ungrasp position, and LP5 indicates failures in motion with part.

Keywords— Fault detection, State estimation, Automated systems, Robotics systems.

Supervised learning approach for banana leaf disease classification for IoT based e-agriculuture

[1]chinmai chippala, [2]praveenkumar morampudi, [3]praveen joel, [4]Dr. D. Venkatesan

[1234]UG Scholar, [5] Assistant Professor,
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail : chinmaichippala@gmail.com

ABSTRACT

Abstract— In recent agricultural advancements, IoT-based applications have transformed farming practices by integrating technology for improved crop monitoring and disease detection. Swift identification of banana leaf diseases is crucial for timely farmer intervention and effective disease management. Early detection permits targeted treatments, resulting in healthier crops and higher yields. Accurate disease identification reduces agrochemical misuse, saving farmers costs. The IoT-driven system enables remote crop health monitoring across geographically dispersed farms. Aggregated disease data analysis provides actionable insights for informed decision-making and improved agricultural practices. Traditional methods of banana leaf disease classification rely on subjective visual inspection by experts, leading to inconsistent results and delays in diagnosis. This study addresses this challenge by proposing a novel supervised learning approach using image processing and machine learning algorithms. The aim is to accurately identify banana leaf diseases efficiently. This method aims to contribute to early disease detection, minimizing crop losses, and maximizing yields, essential for sustainable agriculture.

Keywords— IoT based agriculture, disease detection, banana leaf diseases, machine learning, crop monitoring.

An empirical study on Brain-Computer Interfaces using Machine Learning: Reducing CBT in Motor Imagery

[1] **Dr.M.Sreedhar Reddy**   [2]**Dr.K.Srinivas**
[1]Professor,   [2] Associate Professor
Department of Computer Science and Engineering (AI&ML)
St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail : srircl1@gmail.com

ABSTRACT

Abstract— The biggest challenge for BCI's is that not everyone has the same brain. Brain-Computer Interfaces (BCI's) are new customs for human beings to interact with a workstation, by using only the brain. BCI's can be very useful for people who have lost the ability to control their limbs, as BCI's can give these people the opportunity to, for example, steer a wheelchair, using Motor Imagery. Motor Imagery is the process where the patient imagines a movement, resulting in a signal originating from the brain and measurable through EEG.Using Machine learning, for every new session, the BCI has to learn from the user's brain, but this learning takes time. The time that the BCI needs to adapt to the user's brain in order to correctly classify their thoughts, is known as the calibration time, this calibration could take up to 20 - 30 minutes, which is an exhausting and tiring amount of time that the patient has to wait until the system is fully functional.

One of the major reasons that limit the practical applications of a brain-computer interface (BCI) is its long calibration time. In this paper, we suggest a narrative approach to dipping the calibration time of motor imagery (MI)-based on Brain computer interfaces without forfeit classification of accuracy. This is to reduce this calibration time as much as possible. First attempt is done by finding an optimal amount of features needed for reasonable functioning of the BCI, using all calibration data available. Averaged over five subjects, the amount of correctly classified thoughts only reached $67 \pm 15\%$.

***Keywords*-**Brain-Computer Interfaces, Machine Learning, Calibration time, Motor Imagery, Transfer Learning, Linear discriminant analysis

Real Time Machine Learning Detection of Heart Ailment

[1]Dr. Govinda Rajulu. G, [2]Dr.S. Kalvikkarasi
[1]Professor and HOD, [2] Professor
[1]Department of Computer science and Design,[2]Dept of ECE
St Martin's Engineering College, PCET

*Corresponding Author
E-mail: drgovindacse@smec.ac.in

ABSTRACT

Abstract— According to recent survey by UN agency (World health organization) 17.9 million individuals die annually owing to heart connected diseases and it's increasing day-by-day. With the increasing population and illness, it's become achallenge to diagnoseillness and providing the suitable treatment at the proper time. However, there's a light-weight of hope that recent advances in technology have accelerated the general public health sector by developing advanced useful medical specialty solutions. This paper aims at analysing the assorted datamining techniques particularly Naive Thomas Bayes, Random Forest Classification, Decision tree, Support Vector Machine and logistic Regression by employing a qualified dataset for Heart disease prediction that is include varied attributes like gender, age, blood pressure level, blood glucose etc. The analysis includes finding the correlations between the assorted attributes of the dataset by utilizing the quality data processing techniques and thus treating the attributes befittingly to predict the possibilities of a heart disease. These machine learning techniques take less time for the prediction of the illness with a lot of accuracy which can know priorly about heart disease and can take related treatment

Keywords—Decision tree, Support Vector Machine, Analysis, attributes.

AUTOMATIC LICENSE PLATE RECOGNITION SYSTEM

[1] Mr V. Sathish *, Dr. Govinda Rajulu. G[2]
[1]Assistant Professor , [2]Professor & HOD
[1,2] Department of Computer Science and Design
[1,2]St. Martin's Engineering College, Secunderabad, Telangana, India

*Corresponding Author
E-mail: v.sathish1984@gmail.com

ABSTRACT

Abstract— The Aim of the paper is to make a high efficient Automatic license plate recognition system. Automatic License Plate Recognition (ALPR) is a technology that enables automatic detection, recognition, and processing of license plates on vehicles. It uses optical character recognition (OCR) technology to extract the alphanumeric characters on a license plate, and can be used for a variety of applications such as toll collection, parking management, and law enforcement.ALPR systems consist of cameras that capture images of license plates, image processing software that extracts the characters from the images, and a database that stores the license plate information. The system can then match the license plate information against a database of known vehicles, allowing authorities to quickly identify stolen or wanted vehicles, or to track the movement of suspect vehicles.ALPR systems are becoming increasingly common in many countries around the world, and are being used for a variety of applications. While the technology offers many benefits in terms of efficiency and improved security, it also raises concerns about privacy and potential misuse of data. As such, there is an ongoing debate about the appropriate use of ALPR systems and the need to balance security concerns with individual privacy rights

Keywords: — plate recognition, character recognition, automatic license.

MACHINE LEARNING FRAMEWORK FOR PREDICTION OF ADMISSION IN ENGINEERING COLLEGE

[1] **Mr K.Laxman Kumar ***, **Dr. Govinda Rajulu. G**[2]

[1]Assistant Professor , [2]Professor & HOD

[1,2] Department of Computer Science and Design

[1,2]St. Martin's Engineering College, Secunderabad, Telangana, India

*Corresponding Author

E-mail: k.laxman530@gmail.com

ABSTRACT

Abstract—Utilizing machine learning (ML), enormous amounts of information can be re-evaluated and discover particular patterns that might not be immediately noticeable or recognizable to humans. ML strategies have increasingly been used to assess educational data such as student class performance. In the pursuit of the academic well-being of students, the utilization of neoteric technologies such as data mining, data management, and ML has increased. Data mining is the idea of extracting undisclosed information from many raw databases. Consequently, the exploration of knowledge acquisition relates to predictive ML models and subsequent decision-making. State-of-the-art of data mining and ML have become more acceptable in predicting student examination evaluations such as grades, achievement, etc. Generally, conventional data mining for educational data analysis aimed at solving problems in an educational context can be described as educational data mining. Currently, intelligent computer-based methods such as artificial intelligence and data mining have been successfully applied to improve people's daily lives.

A couple of million students participate in the bachelor's entrance examination at government-run universities each year in India. However, Indian students need admission to a public university because private university education costs are too high for middle-income and low-income families. In contrast, the government primarily covers public university costs. Therefore, this project implements the prediction of college admission for engineering or college students using machine learning algorithm.

Keywords: — Knowledge acquisition, decision making, Utilizing learning.

DETECTION OF CYBER ATTACKS IN NETWORK USING MACHINE LEARNING TECHNIQUES

[1] Mr D.Venkatesan *, Dr. Govinda Rajulu. G[2]

[1]Assistant Professor , [2]Professor & HOD

[1,] Department of Computer Science Engineering(AI&ML), [2] Department of Computer science and Design

[1,2]St. Martin's Engineering College, Secunderabad, Telangana, India

*Corresponding Author

E-mail: dvenkatesanme@gmail.com

ABSTRACT

Abstract—Utilizing machine learning (ML), enormous amounts of information can be re-evaluated and discover particular patterns that might not be immediately noticeable or recognizable to humans. ML strategies have increasingly been used to assess educational data such as student class performance. In the pursuit of the academic well-being of students, the utilization of neoteric technologies such as data mining, data management, and ML has increased. Data mining is the idea of extracting undisclosed information from many raw databases. Consequently, the exploration of knowledge acquisition relates to predictive ML models and subsequent decision-making. State-of-the-art of data mining and ML have become more acceptable in predicting student examination evaluations such as grades, achievement, etc. Generally, conventional data mining for educational data analysis aimed at solving problems in an educational context can be described as educational data mining. Currently, intelligent computer-based methods such as artificial intelligence and data mining have been successfully applied to improve people's daily lives.

Keywords— Cyber Threat; Cybercrime; Performance Evaluation; Machine Learning Application; Intrusion Detection System; Malware Detection; Spam Classification

ANALYSIS AND DETECTION OF AUTISM SPECTRUM DISORDER USING MACHINE LEARNING TECHNIQUES

[1] Mrs. G. Priyanka *, Mrs. [2] N. Radhama
[12] Assistant Professor ,
[12] Department of Computer Science Engineering(AI&ML)
[1,2]St. Martin's Engineering College, Secunderabad, Telangana, India

*Corresponding Author
E-mail: gpriyankacse@smec.ac.in

ABSTRACT

Abstract— Autism Spectrum Disorder (ASD) is a neuro-disorder in which a person has a lifelongeffect on interaction and communication with others. Autism can be diagnosed at any stage in once life and is said to be a "behavioural disease" because in the first two years of life symptoms usually appear. According to the ASD problem starts with childhoodand continues to keep going on into adolescence and adulthood. Propelled with the risein use of machine learning techniques in the research dimensions of medical diagnosis,in this paper there is an attempt to explore the possibility to use Naïve Bayes, Support Vector Machine, Logistic Regression, KNN, Neural Network and Convolutional Neural Network for predicting and analysis of ASD problems in a child, adolescents, and adults. The proposed techniques are evaluated on publicly available three differentnon-clinically ASD datasets. First dataset related to ASD screening in children has 292 instances and 21 attributes. Second dataset related to ASD screening Adult subjects contains a total of 704 instances and 21 attributes. Third dataset related to ASD screening in Adolescent subjects comprises of 104 instances and 21 attributes. After applying various machine learningtechniques and handling missing values, results strongly suggest that CNN based prediction models work better on all these datasets with higher accuracy of 99.53%, 98.30%, 96.88% for Autistic Spectrum Disorder Screening in Data for Adult, Children, and Adolescents respectively.

Keywords- Logistic Regression , Spectrum Disorder.

MACHINE LEARNING FRAMEWORK FOR PREDICTION OF ADMISSION IN ENGINEERING COLLEGE

[1] Mr. N. Kranthi Kumar *, [2] Mr.K. Nagaraju
[12] Assistant Professor ,
[12] Department of Computer Science Engineering(AI&ML)
[1,2]St. Martin's Engineering College, Secunderabad, Telangana, India

*Corresponding Author
E-mail: kranthi0066@gmail.com

ABSTRACT

Abstract— Utilizing machine learning (ML), enormous amounts of information can be re-evaluated and discover particular patterns that might not be immediately noticeable or recognizable to humans. ML strategies have increasingly been used to assess educational data such as student class performance. In the pursuit of the academic well-being of students, the utilization of neoteric technologies such as data mining, data management, and ML has increased. Data mining is the idea of extracting undisclosed information from many raw databases. Consequently, the exploration of knowledge acquisition relates to predictive ML models and subsequent decision-making. State-of-the-art of data mining and ML have become more acceptable in predicting student examination evaluations such as grades, achievement, etc. Generally, conventional data mining for educational data analysis aimed at solving problems in an educational context can be described as educational data mining. Currently, intelligent computer-based methods such as artificial intelligence and data mining have been successfully applied to improve people's daily lives. A couple of million students participate in the bachelor's entrance examination at government-run universities each year in India. Nevertheless, only a few thousand are admitted after this competitive examination. In some cases, it was observed that many candidates struggled hard during this period. However, they could not get admission to a public university in India, resulting in an unforeseeable future. Numerous factors could be behind their unsuccessful admission to a public university, such as family circumstances, frustration, admission test anxiety, etc. However, Indian students need admission to a public university because private university education costs are too high for middle-income and low-income families. In contrast, the government primarily covers public university costs. Therefore, this project implements the prediction of college admission for engineering or college students using machine learning algorithm.

Keywords: Neoteric, data management , machine learning.

TRAFFIC SIGN RECOGNITION USING DEEP LEARNING FOR AUTONOMOUS DRIVERLESS VEHICLES

[1] **Mr. P. Mahesh***, [2] **Mr.D. Venkatesan**

[12] Assistant Professor ,
[12] Department of Computer Science Engineering(AI&ML)
[1,2]St. Martin's Engineering College, Secunderabad, Telangana, India

*Corresponding Author
E-mail: dvenkatesanme@gmail.com

ABSTRACT

Abstract— This project proposes simplified Gabor filters to preprocess the grayscale images of traffic scenes, to enhance the edges and strengthen the shape information. In addition, this could make the non-edge areas of painted artificial objects, such as traffic signs, more stable and reduce the noise in such areas. We use the maximally stable extremal regions (MSERs) algorithm to process the simplified Gabor filtered map to find the regions of interest more effectively, and we used our defined rules to filter out significant negative samples. We first used an eight-channel simplified Gabor feature as the input of the CNNs, which were defined as a pre-convolutional layer of the convolutional neural networks (CNNs) for traffic sign classification. Our method performs only one feature extraction through the detection and classification stage, which causes feature sharing throughout the two stages. Compared with algorithms used in the different feature extraction methods, in the detection and classification stage, this saves a lot of processing time and makes it feasible for use in real time applications.

Keywords: Traffic, Pre-Convolutional Layer, Artificial, Classification, Traffic Sign.

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TRAFFIC SIGN RECOGNITION USING DEEP LEARNING FOR AUTONOMOUS DRIVERLESS VEHICLES

[1] Mrs. N. Radhama *, Mrs. [2] G. Priyanka

[12] Assistant Professor ,

[12] Department of Computer Science Engineering (AI&ML)

[1,2]St. Martin's Engineering College, Secunderabad, Telangana, India

*Corresponding Author

E-mail: radhammacse@smec.ac.in

ABSTRACT

Abstract - Now-a-days biometric systems are useful in recognizing a person's identity, but criminals change their appearance in behavior and psychological to deceive recognition system. To overcome this problem, we are using a new technique called Deep Texture Features extraction from images and then building train machine learning model using CNN (Convolution Neural Networks) algorithm. This technique refers to as LBPNet or NLBPNet as this technique heavily dependent on features extraction using LBP (Local Binary Pattern) algorithm. In this project we are designing LBP Based machine learning Convolution Neural Network called LBPNET to detect fake face images. Here first we will extract LBP from images and then train LBP descriptor images with Convolution Neural Network to generate training model. Whenever we upload new test image then that test image will be applied on training model to detect whether test image contains fake image or non-fake image. Below we can see some details on LBP

Keywords: Biometric system , deep texture , training model.

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CNN MODEL FOR RECOGNITION OF SIGN LANGUAGE INTO TEXT AND SPEECH

[1] **Mr. K. Nagaraju***, [2] **Mr. N. Kranthi Kumar**

[12] Assistant Professor ,
[12] Department of Computer Science Engineering (AI&ML)
[1,2]St. Martin's Engineering College, Secunderabad, Telangana, India

*Corresponding Author
E-mail: knagarajucsm@smec.ac.in

ABSTRACT

Abstract— Sign Language Recognition (SLR) targets interpreting the sign language into text or speech, so as to facilitate the communication between deaf-mute people and ordinary people. This task has broad social impact but is still very challenging due to the complexity and large variations in hand actions. Existing methods for SLR use hand-crafted features to describe sign language motion and build classification models based on those features. However, it is difficult to design reliable features to adapt to the large variations of hand gestures. To approach this problem, we propose a novel convolutional neural network (CNN) which extracts discriminative spatial-temporal features from raw video stream automatically without any prior knowledge, avoiding designing features. To boost the performance, multi-channels of video streams, including color information, depth clue, and body joint positions, are used as input to the CNN in order to integrate color, depth and trajectory information. We validate the proposed model on a real dataset collected with Microsoft Kinect and demonstrate its effectiveness over the traditional approaches based on hand-crafted features.

Keywords: sign language recognition, temporal features, hand gestures.

TRAFFIC SIGN RECOGNITION USING DEEP LEARNING FOR AUTONOMOUS DRIVERLESS VEHICLES

[1] **Mr. R. Karthikeyan***, [2] **Mr. R. Asokkumar**

[1] Assistant Professor , [2]Assistant Professor
[12] Department of Computer Science Engineering (AI&ML)
[1]St. Martin's Engineering College, Secunderabad, Telangana, India, [2]KL University

*Corresponding Author
E-mail: rkarthikeynit@smec.ac.in

ABSTRACT

Abstract— The rapid growth of opportunities to share job ads through social media and electronic media has increased the percentage of fraudulent job postings, causing harassment to job seekers. This has led to a lack of interest in new job postings due to concerns about preserving the security and consistency of personal, academic, and professional information. Thus, the true motive of valid job postings through social and electronic media faces an extremely challenging task in gaining people's belief and reliability. Technologies are meant to make our lives easier and more developed, not to create an insecure environment for our professional lives. To address this issue, this project proposes the use of different data mining techniques and classification algorithms such as K-nearest neighbor, decision tree, support vector machine, naive Bayes classifier, random forest classifier, and multi-layer perceptron to predict whether a job advertisement is real or fraudulent. The Employment Scam Aegean Dataset (EMSCAD), which contains 18,000 samples, was used for experimentation. The deep neural network, serving as the classifier, performs exceptionally well for this classification task. Three dense layers were employed in this deep neural network classifier. The trained classifier demonstrates an approximate classification accuracy of 98% (DNN) for predicting fraudulent job.

Keywords: social media , reliability, decision tree.

ENSEMBLE CLASSIFIER FOR TYPE 2 DIABETES PREDICTION WITH USER AND CLOUD APPLICATIONS

[1] Mrs. S. Gnana Prasanna*, [2] Mrs. T. Kanakamma

[12] Assistant Professor ,
[12] Department of Computer Science Engineering (AI&ML)
[1]St. Martin's Engineering College, Secunderabad, Telangana, India,

*Corresponding Author
E-mail: gnanaprasannad@gmail.com

ABSTRACT

Abstract— This project uses today's 5G technology to monitor condition of diabetic patients with low cost. Now-a-days many people's are suffering with diabetic disease due to work stress or unhealthy lifestyles and peoples will not know about the current health condition till symptoms appear or diagnosis through medical check-up and the condition of disease will be severe by that time and there is no possible way to get that intimation prior. Diabetes will be of two type's diabetes-1 and diabetes-2. Diabetes-2 require hospitalization and in diabetes-1 condition we can monitor patient and alert him or doctors about his current condition

Keywords – 5G technology, symptoms.

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FACE RECOGNITION BASED ATTENDANCE MANAGMENT SYSTEM: A REALTIME APPLICATION

1 Mr.Maloth Srinivas*, 2 Mrs. M. Naga Triveni
[12] Assistant Professor ,
[12] Department of Computer Science Engineering (AI&ML)
[1]St. Martin's Engineering College, Secunderabad, Telangana, India,

*Corresponding Author
E-mail: msrinivascse@smec.ac.in

ABSTRACT

Abstract— Nowadays Educational institutions are concerned about the regularity of student attendance. This is mainly due to students' overall academic performance being affected by their attendance in the institute. Mainly there are two conventional methods of marking attendance which is calling out the roll call or by taking student signs on paper. They both were more time-consuming and difficult. Hence, there is a requirement for a computer-based student attendance management system that will assist the faculty in maintaining attendance records automatically. In this project, we have implemented the automated attendance system using a face recognition application. We have projected our ideas to implement an "Automated Attendance System Based on Facial Recognition," which imbibes large applications. The application includes face identification, which saves time and eliminates chances of proxy attendance because of face authorization. Hence, this system can be implemented in a field where attendance plays an important role. The system is designed using a deep python platform. The proposed system uses Principal Component Analysis (PCA), OpenCV, and the Haar cascade algorithm which is based on the eigenface approach. This algorithm compares the test image and training image and determines students who are present and absent

Keywords – principal component analysis, automated , OpenCV.

HELMET DETECTION AND NUMBER PLATE RECOGNITION USING DEEP LEARNING

[1] Mrs. T. Kanakamma *, [2] Mrs. S. Gnana Prasanna
[12] Assistant Professor ,
[12] Department of Computer Science Engineering (AI&ML)
[1]St. Martin's Engineering College, Secunderabad, Telangana, India,

*Corresponding Author
E-mail: gnanaprasannad@gmail.com

ABSTRACT

Abstract— In current situation, we come across various problems in traffic regulations in India which can be solved with different ideas. Riding motorcycle/mopeds without wearing helmet is a traffic violation which has resulted in increase in number of accidents and deaths in India. Existing system monitors the traffic violations primarily through CCTV recordings, where the traffic police have to look into the frame where the traffic violation is happening, zoom into the license plate in case rider is not wearing helmet. But this requires lot of manpower and time as the traffic violations frequently and the number of people using motorcycles is increasing day-by-day. What if there is a system, which would automatically look for traffic violation of not wearing helmet while riding motorcycle/moped and if so, would automatically extract the vehicles' license plate number. Recent research have successfully done this work based on CNN, R-CNN, LBP, HOG,HAAR features etc. But these works are limited with respect to efficiency, accuracy or the speed with which object detection and classification is done. In this research work, a Non-Helmet Rider detection system is built which attempts to satisfy the automation of detecting the traffic violation of not wearing helmet and extracting the vehicle license plate number. The main principle involved is Object Detection using Deep Learning at three levels. The objects detected are person, motorcycle/moped at first level using YOLOv2, helmet at second level using YOLOv3, License plate at the last level using YOLOv2. Then the license plate registration number is extracted using OCR (Optical Character Recognition). All these techniques are subjected to predefined conditions and constraints, especially the license plate number extraction part. Since, this work takes video as its input, the speed of execution is crucial. We have used above said methodologies to build a holistic system for both helmet detection and license plate number extraction.

Keywords: Traffic violation ,Automation, object detection.

MISSING CHILD IDENTIFICATION SYSTEM USING DEEP LESRNING AND MULTICLASS SVM

[1] Mrs. M. Naga Triveni, *, [2] Mr. Mr.Maloth Srinivas

[12] Assistant Professor ,

[12] Department of Computer Science Engineering (AI&ML)

[1]St. Martin's Engineering College, Secunderabad, Telangana, India,

*Corresponding Author

E-mail: mnagatrivenicse@smec.ac.in

ABSTRACT

Abstract— In India a countless number of children are reported missing every year. Among the missing child cases a large percentage of children remain untraced. This paper presents a novel use of deep learning methodology for identifying the reported missing child from the photos of multitude of children available, with the help of face recognition. The public can upload photographs of suspicious child into a common portal with landmarks and remarks. The photo will be automatically compared with the registered photos of the missing child from the repository. Classification of the input child image is performed and photo with best match will be selected from the database of missing children. For this, a deep learning model is trained to correctly identify the missing child from the missing child image database provided, using the facial image uploaded by the public. The Convolutional Neural Network (CNN), a highly effective deep learning technique for image-based applications is adopted here for face recognition. Face descriptors are extracted from the images using a pre-trained CNN model VGG-Face deep architecture. Compared with normal deep learning applications, our algorithm uses convolution network only as a high-level feature extractor and the child recognition is done by the trained SVM classifier. Choosing the best performing CNN model for face recognition, VGG-Face and proper training of it results in a deep learning model invariant to noise, illumination, contrast, occlusion, image pose and age of the child and it outperforms earlier methods in face recognition based missing child identification. The classification performance achieved for child identification system is 99.41%. It was evaluated on 43 Child cases.

Keywords: Missing child identification, face recognition, deep learning, CNN, VGG-Face, Multi class SVM

THE CNN AND DPM BASED APPROACH FOR MULTIPLE OBJECT DETECTION IN IMAGES

[1] Dr.S. Rabindranath , *, [2] Mrs.N. Suma Manjunath, [3] Ms. S. Kamala Harsha

[1]Associate Professor ,[2][3]Assistant Professor

[1][2][3]Department of CSE,

[1][2][3] AMC Engineering College, Banglore ,

*Corresponding Author

E-mail: Rabindranath.surendran@amceducation.in

ABSTRACT

Abstract— With the development of intelligent device and social media, the bulk of data on Internet has grown with high speed. There are so many important aspect in image processing, object detection is one of the international demanded research field. Multiple object detection is an important concept in object detection. In object detection extracting the features and handling the occlusion are two most important components. A Region-based Convolution Neural Network (R-CNN) has achieved great success in extracting the region based features which may used for extracting multiple regions from the images and Deformable Part Based Model (DPM) improve the ability for handling the occlusion. Occlusion handling is nothing but when multiple objects are near to each other that time some objects are not detected so this drawback will be handled by DPM. Existing method not performing well in the aspect of detecting multiple objects. In this paper RCNN and DPM are to be integrated to detect multiple objects. By combining these two models we are able to notice every single object with high accuracy.

Keywords – Intelligent device , Deformable,Occlusion.

ENERGY EFFICIENT IOT VIRTUALIZATION FRAMEWORK USING PEER TO PEER NETWORKING AND PROCESSING

[1] Dr. K. Srinivas , *, [2] Mr. D. Venkatesan
[1]Associate Professor , [2]Assistant Professor
[12] Department of Computer Science Engineering (AI&ML)
[1]St. Martin's Engineering College, Secunderabad, Telangana, India,

*Corresponding Author
E-mail: drksrinivascse@smec.ac.in

ABSTRACT

Abstract— We are investigating the energy efficiency of an IoT virtualization framework with P2P network and edge computing. This investigation has been carried out by considering three different scenarios. A MILP was developed to maximize the number of processing tasks served by peers and minimize the total power consumption of the network. An energy efficient IoT virtualization framework with peer-to-peer (P2P) networking and edge processing is proposed. In this network, the IoT task processing requests are served by peers. IoT objects and relays that host virtual machines (VMs) represents the peers in the proposed P2P network. We have considered three scenarios to investigate the saving in power consumption and the system capabilities in terms of task processing. The first scenario is a 'relays only' scenario, where the task requests are processed using relays only. The second scenario is an 'objects only' scenario, where the task requests are processed using the IoT objects only. The last scenario is a hybrid scenario, where the task requests are processed using both IoT objects and VMs. We have developed a mixed integer linear programming (MILP) model to maximize the number of processing tasks served by the system, and minimize the total power consumed by the IoT network. Based on the MILP model principles, we developed an energy efficient virtualized IoT P2P networks heuristic (EEVIPN). Our results show that the hybrid scenario serves up to 77% (57% on average) processing task requests, but with higher energy consumption compared to the other scenarios. The relays only scenario serves 74% (57% on average) of the processing task requests with 8% saving in power consumption compared to the hybrid scenario. In contrast, 28% (22% on average) of task requests can be handled by the objects only scenario with up to 62% power saving compared to the hybrid scenario.

Keywords – Virtual Machine , Virtualization framework, hybrid scenario.

ENERGY EFFICIENT IOT VIRTUALIZATION FRAMEWORK USING PEER TO PEER NETWORKING AND PROCESSING

[1] **Mr.G. Sathish Kumar , *, [2] Mr. P. Mahesh**
[12] Assistant Professor ,
[12] Department of Computer Science Engineering (AI&ML)
[1]St. Martin's Engineering College, Secunderabad, Telangana, India,

*Corresponding Author
E-mail:gundasatish27@gmail.com

ABSTRACT

Abstract— The technology that we are using here is Natural Language Processing (NLP) for achieving word segmentation through Feature Extraction method. NLP (Natural Language Processing) is a technology that enables computers to understand human languages. Deep-level grammatical and semantic analysis usually uses words as the basic unit, and word segmentation is usually the primary task of NLP.In order to solve the practical problem of huge structural differences between different data modalities in a multi-modal environment and traditional machine learning methods cannot be directly applied; this paper introduces the feature extraction method of deep learning and applies the ideas of deep learning to multi- modal feature extraction. This paper proposes a multi-modal neural network. For each mode, there is a multi layer sub- neural network with an independent structure corresponding to it. In terms of word segmentation processing, in view of the problems that existing word segmentation methods can hardly guarantee long-term dependency of text semantics and long training prediction time, a hybrid network English word segmentation processing method is proposed.This method applies BI-GRU (Bidirectional Gated Recurrent Unit) to English word segmentation, and uses the CRF (Conditional Random Field) model to annotate sentences in sequence, effectively solving the long-distance dependency of text semantics, shortening network training and predicted time.Experiments show that the processing effect of this method on word segmentation is similar to that of BI- LSTM- CRF (Bidirectional- Long Short Term Memory-Conditional Random Field) model, but the average predicted processing speed is 1.94 times that of BI-LSTM- CRF, effectively improving the efficiency of word segmentation processing.

Keywords – Bidirectional Gated Recurrent, Memory conditional random filed.

IMPLEMENTATION OF BLOCKCHAIN IN FINANCIAL SECTOR TO IMPROVE SCALABILITY

[1] **Mr.K. Mahesh Kumar** , [2]**Mr. N. Kranthi Kumar**

[12] Assistant Professor ,

[1]Department of AI & DS,   [2]Department of Computer Science Engineering (AI&ML)

[1] Guru Nanak institutions, [2]St. Martin's Engineering College, Secunderabad, Telangana, India,

*Corresponding Author

E-mail:koppunur@gmail.com

ABSTRACT

Abstract— Blockchain systems store transaction data in the form of a distributed ledger where each peer is to maintain an identical copy. This Project is proposed to improve storage efficiency by incorporating secret sharing, private key encryption, and information dispersal algorithms. However, the DSB results in significant communication cost when peer failures occur due to denial of service (DoS) attacks. In this project, we propose a new DSB approach based on a local secret sharing (LSS) scheme with a hierarchical secret structure of one global secret and several local secrets. The proposed DSB approach with LSS improves the storage and recovery communication costs. In the original DSB, the private keys act as the local secrets for subsets of peers and the hashes are the global secrets. These local and global secrets are stored by using two independent secret sharing schemes. On the other hand, the LSS efficiently incorporates local secrets and global secrets into a hierarchical secret sharing scheme.We characterize trade-offs between storage and communication cost of traditional blockchain, original DSB and proposed Distributed Storage Blockchain (DSB) with Local Secret Sharing (LSS). These trade-offs explicitly show how the proposed approach improves the storage and communication costs.

Keywords- Distributed Ledger , encryption, local secret sharing.

EFFICIENT LOCAL SECRET SHARING FOR DISTRIBUTED BLOCKCHAIN SYSTEMS

[1] Ramavath Vinoth Kumar *, [2] Mr. N. Kranthi Kumar

[12] Assistant   Professor ,
[1]Department of CSE , [2] Department of CSE(AI&ML)
[1]Sri Indu College of Engineering and Technology, [2]St. Martin's Engineering College, Dhulapally, Telangana, India

*Corresponding Author
E-mail: vinod kumar9r@gmail.com

ABSTRACT

Abstract— Blockchain systems store transaction data in the form of a distributed ledger where each peer is to maintain an identical copy. This Project is proposed to improve storage efficiency by incorporating secret sharing, private key encryption, and information dispersal algorithms. However, the DSB results in significant communication cost when peer failures occur due to denial of service (DoS) attacks. In this project, we propose a new DSB approach based on a local secret sharing (LSS) scheme with a hierarchical secret structure of one global secret and several local secrets. The proposed DSB approach with LSS improves the storage and recovery communication costs. In the original DSB, the private keys act as the local secrets for subsets of peers and the hashes are the global secrets. These local and global secrets are stored by using two independent secret sharing schemes. On the other hand, the LSS efficiently incorporates local secrets and global secrets into a hierarchical secret sharing scheme.We characterize trade-offs between storage and communication cost of traditional blockchain, original DSB and proposed Distributed Storage Blockchain (DSB) with Local Secret Sharing (LSS). These trade-offs explicitly show how the proposed approach improves the storage and communication costs.

Keywords- Local secret sharing, denial of service, dispersal algorithms.

ENERGY EFFICIENT IOT VIRTUALIZATION FRAMEWORK USING PEER TO PEER NETWORKING AND PROCESSINGS

[1]Ms. S. Kamala Harsha, [2]N. Mrs. Suma Manjunath, [3]Dr. S. Rabindranath ,
[1]Assistant Professor ,[23] Associate Professor
[12 3]Department of CSE,

[123] AMC Engineering College, Banglore

*Corresponding Author
E-mail: kamala.harsha@amceducation.in

ABSTRACT

Abstract— A MILP was developed to maximize the number of processing tasks served by peers and minimize the total power consumption of the network. An energy efficient IoT virtualization framework with peer-to-peer (P2P) networking and edge processing is proposed. In this network, the IoT task processing requests are served by peers. IoT objects and relays that host virtual machines (VMs) represents the peers in the proposed P2P network. We have considered three scenarios to investigate the saving in power consumption and the system capabilities in terms of task processing. The first scenario is a 'relays only' scenario, where the task requests are processed using relays only. The second scenario is an 'objects only' scenario, where the task requests are processed using the IoT objects only. The last scenario is a hybrid scenario, where the task requests are processed using both IoT objects and VMs. We have developed a mixed integer linear programming (MILP) model to maximize the number of processing tasks served by the system, and minimize the total power consumed by the IoT network. Based on the MILP model principles, we developed an energy efficient virtualized IoT P2P networks heuristic (EEVIPN). Our results show that the hybrid scenario serves up to 77% (57% on average) processing task requests, but with higher energy consumption compared to the other scenarios. In contrast, 28% (22% on average) of task requests can be handled by the objects only scenario with up to 62% power saving compared to the hybrid scenario.

Keywords – Virtualization, virtual machine, linear programming.

ROAD TRAFFIC VEHICLE DETECTION AND TRACKING USING DEEP LEARNING WITH CUSTOM-COLLECTED AND PUBLIC DATASETS

[1]N. Mrs. Suma Manjunath, [2]Dr. S. Rabindranath , , [3] Ms. S. Kamala Harsha
[1]Assistant Professor ,[23] Associate Professor
[12 3]Department of CSE,
[123] AMC Engineering College, Banglore
*Corresponding Author
E-mail: suma.manjunath@amceducation.in

ABSTRACT

Abstract— Deep learning is a type of machine learning and artificial intelligence that imitates the way humans gain certain types of knowledge. Deep learning is revolutionizing smart cities and societies, solving many longstanding problems. Transportation is continuing to cause unbelievable damages including 1.25million deaths and trillions dollars annually. This paper presents a study on the use of YOLOv4 for vehicle detection and DeepSORT for tracking the detected vehicles on roads. We have used three different variations of the deep learning models and compare their performance ;a pre-trained model with COCO dataset, two customtrained models with the Berkeley Deep-Drive dataset our custom-developed dataset obtained by a Dash Cam installed onboard vehicle driven on KSA road in five different traffic conditions. City traffic in day and night, highway traffic in day and night, and traffic in rain. We have used Google Colab platform to harness GPU power, CUDA and OpenCV. The results have been evaluated using precision and other metrics.

Keywords – Deep Sort , Dash cam . Colab.

DEEP LEARNING FOR SMARTPHONE BASED MALARIA PARASITE DETECTION IN THICK BLOOD SMEARS

[1] Dr.B.Narsimha, [2]Mrs. S. Gnana Prasanna
[1] Professor & Head ,[2]Assistant Professor
[1]Department of CSE, [2]Department of CSE(AI&ML)
[1]Holy Mary Institute of Technology , [2] St. Martin's Engineering College, Secunderabad, Telangana, India,

*Corresponding Author
E-mail:narsimha532@gmail.com

ABSTRACT

This work investigates the possibility of automated malaria parasite detection in thick blood smears with smartphones. Methods: We have developed the first deep learning method that can detect malaria parasites in thick blood smear images and can run on smartphones. Our method consists of two processing steps. First, we apply an intensity based Iterative Global Minimum Screening (IGMS), which performs a fast screening of a thick smear image to find parasite candidates. Then, a customized Convolutional Neural Network (CNN) classifies each candidate as either parasite or background. Together with this paper, we make a dataset of 1819 thick smear images from 150 patients publicly available to the research community. We used this dataset to train and test our deep learning method, as described in this paper. Results: A patient-level five fold cross-evaluation demonstrates the effectiveness of the customized CNN model in discriminating between positive (parasitic) and negative image patches in terms of the following performance indicators: accuracy (93.46% ± 0.32%), AUC (98.39% ± 0.18%), sensitivity (92.59% ± 1.27%), specificity (94.33% ± 1.25%), precision (94.25% ± 1.13%), and negative predictive value (92.74% ± 1.09%). High correlation coefficients (>0.98) between automatically detected parasites and ground truth, on both image level and patient level, demonstrate the practicality of our method. Conclusion: Promising results are obtained for parasite detection in thick blood smears for a smartphone application using deep learning methods.

Keywords – Automated malaria parasite, Global Minimum Screening, deep learning.

MISSING CHILD IDENTIFICATION SYSTEM USING DEEP LESRNING AND MULTICLASS SVM

[1] Mr. Ramavath Mahendar [2] Mrs. G. Priyanka
[12] Assistant Professor ,
[1]Department of CSE, Department of CSE(AI&ML)
[1]Keshav Memoria College of Engineering , [2]St. Martin's Engineering College, Secunderabad, Telangana, India

*Corresponding Author
E-mail: rmahendracse@gmail.com

ABSTRACT

In India a countless number of children are reported missing every year. Among the missing child cases a large percentage of children remain untraced. This paper presents a novel use of deep learning methodology for identifying the reported missing child from the photos of multitude of children available, with the help of face recognition. The public can upload photographs of suspicious child into a common portal with landmarks and remarks. The photo will be automatically compared with the registered photos of the missing child from the repository. Classification of the input child image is performed and photo with best match will be selected from the database of missing children. For this, a deep learning model is trained to correctly identify the missing child from the missing child image database provided, using the facial image uploaded by the public. The Convolutional Neural Network (CNN), a highly effective deep learning technique for image-based applications is adopted here for face recognition. Face descriptors are extracted from the images using a pre-trained CNN model VGG-Face deep architecture. Compared with normal deep learning applications, our algorithm uses convolution network only as a high-level feature extractor and the child recognition is done by the trained SVM classifier. Choosing the best performing CNN model for face recognition, VGG-Face and proper training of it results in a deep learning model invariant to noise, illumination, contrast, occlusion, image pose and age of the child and it outperforms earlier methods in face recognition based missing child identification. The classification performance achieved for child identification system is 99.41%. It was evaluated on 43 Child cases.

Keywords— Missing child identification, face recognition, deep learning, CNN, VGG-Face, Multi class SVM.

A Machine Learning Model for Average Fuel Consumption in Heavy Vehicles

¹ Mr. Ch. Rambabu * ² *Mrs.N. Radhama*

¹² Assistant Professor ,
¹Department of CSE, ²Departmen of CSE(AI&ML)
¹Sri Indu college of Engineering , ² 2St. Martin's Engineering College, Secunderabad, Telangana, India

*Corresponding Author
E-mail:chittiprolurambabu@gmail.com

ABSTRACT

This paper advocates a data summarization approach based on distance rather than the traditional time period when developing individualized machine learning models for fuel consumption. This approach is used in conjunction with seven predictors derived from vehicle speed and road grade to produce a highly predictive neural network model for average fuel consumption in heavy vehicles. The proposed model can easily be developed and deployed for each individual vehicle in a fleet in order to optimize fuel consumption over the entire fleet. The predictors of the model are aggregated over fixed window sizes of distance traveled. Different window sizes are evaluated and the results show that a 1 km window is able to predict fuel consumption with a 0.91 coefficient of determination and mean absolute peak-to-peak percent error less than 4% for routes that include both city and highway duty cycle segments.

Keywords —Vehicle modeling, neural networks, average fuel consumption, data summarization, fleet management.

Quality Risk Analysis for Sustainable Smart Water Supply Using Data Perception

[1] Mr. Vijaykumar Koranki ,[2] Mr.K. Nagaraju
[12] Assistant Professor ,
[1]Department of CSE, [2]Department of CSE(AI&ML)
[1]Sri Indu college of Engineering , [2] 2St. Martin's Engineering College, Secunderabad, Telangana, India

*Corresponding Author
E-mail:Vijay809@gmail.com

ABSTRACT

Constructing Sustainable Smart Water Supply systems are facing serious challenges all around the world with the fast expansion of modern cities. Water quality is influencing our life ubiquitously and prioritizing all the urban management. Traditional urban water quality control mostly focused on routine tests of quality indicators, which include physical, chemical and biological groups. However, the inevitable delay for biological indicators has increased the health risk and leads to accidents such as massive infections in many big cities. In this paper, we first analyze the problem, technical challenges, and research questions. Then we provide a possible solution by building a risk analysis framework for the urban water supply system. It takes indicator data we collected from industrial processes to perceive water quality changes, and further for risk detection. In order to provide explainable results, we propose an Adaptive Frequency Analysis (Adp-FA) method to resolve the data using indicators' frequency domain information for their inner relationships and individual prediction. We also investigate the scalability properties of this method from indicator, geography and time domains. For the application, we select industrial quality data sets collected from a Norwegian project in 4 different urban water supply systems, as Oslo, Bergen, Strømmen and Alesund. We employ the proposed method to test spectrogram, prediction accuracy and time ° consumption, comparing with classical Artificial Neural Network and Random Forest methods. The results show our method better perform in most of the aspects. It is feasible to support industrial water quality risk early warnings and further decision support.

Keywords —Sustainable Water Supply, Water Quality Control, Data Perception, Risk Evaluation, Frequency Analysis, Scalability

ONLINE RAIN OR SNOW REMOVAL FROM SURVEILLANCE VIDEOS

[1] Mrs. Pragalthi Vulpala , [2] Mr.Maloth Srinivas
[12] Assistant   Professor ,
[1]Department of CSE, [2]Department of CSE(AI&ML)
[1]TKR college of Engineering , [2]St. Martin's Engineering College, Secunderabad, Telangana, India,

*Corresponding Author
E-mail:pragathivulpala@gmail.com

ABSTRACT

Rain or Snow removal from surveillance videos is an important task in the computer vision community since rain/snow existing in videos can severely degenerate the performance of many surveillance systems. Rain/snow captured from a practical surveillance camera, however, is always highly dynamic in time, and those videos also include occasionally transformed background scenes and background motions caused by waving leaves or water surfaces. We propose a novel rain/snow removal approach, which fully considers dynamic statistics of both rain/snow and background scenes taken from a video sequence. Specifically, the rain/snow is encoded as an online multi-scale convolutional sparse coding (OMS-CSC) model. Not only finely delivers the sparse scattering and multi-scale shapes of real rain/snow, but also well distinguish the components of background motion from the rain/snow layer.

Keywords — Snow removal , surveillance videos , convolutional sparse coding.

ABOUT CONFERENCE

International Conference on "International Conference on "Innovations and Emerging Trends in Artificial Intelligence and Machine Learning Applications" (ICIETAIML'23) will be organized by Department of CSE (AI & ML), St. Martin's Engineering College, Secunderabad, Telangana, India on 15th & 16th December, 2023. ICIETAIML-23 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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Editor in chief
Dr.P.Santosh Kumar Patra