TECH TRENDS

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Volume 6 Issue 02

KNOWLEDGE IS DIVINE

MALLA REDDY COLLEGE OF ENGINEERING

MALLA REDDY COLLEGE OF ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

EAMCET CODE : MRCE

Permanently affiliated to JNTUH | Approved by AICTE

KNOWLEDGE IS DIVINE

MALLA REDDY COLLEGE OF ENGINEERING

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Founder Chairman Message

“Intellectuals are not born but are made”

The mission of MRCE is to engage in outstanding scholarship that makes a major contribution to the society and to produce groundbreaking researches. Here, students will be provided with an excellent education and the capability to use knowledge gained to exercise, influence and make meaningful lifelong contributions to their community and to the nation. I wish you all the best for achieving greater success and scaling newer heights in your education and career ahead.

I congratulate and thank all the students and staff coordinators who have made untiring efforts to bring out this Souvenir. I wish them all success.

Shri. CH MALLA REDDY

Founder Chairman, MRGI

Hon’ble Minister, Govt. of Telangana

Chairman Message

The mission of MRCE is to engage in outstanding scholarship that makes a major contribution to the society and to produce groundbreaking researches. Here, students will be provided with an excellent education and the capability to use knowledge gained to exercise, influence and make meaningful lifelong contributions to their community and to the nation. I wish you all the best for achieving greater success and scaling newer heights in your education and career ahead.

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Sri Ch. Bhadra Reddy

Chairman, MRGI

Secretary Message

“Intellectuals are not born but are made”

I am extremely happy to bring out this message for the souvenir released on the national level technical fest “Technotsav 2023”

Technology, Teaching, Training are the pillars of our department, importing the latest technical knowledge to the student and cultivating, nurturing the same in the right way will make our students competent in the competitive world. “Technotsav 2023” offers existing platform for the students to exhibit the knowledge they possess and a good change to develop the same.

I congratulate and thank all the students and staff who have made tiring efforts to bring out of this souvenir and wish them all success.

Sri Ch. Mahender Reddy

Secretary, MRGI

Principal Message

Today, there are large numbers of corporate organizations who are looking for smart, creative and dynamic people who should be capable of managing their resources. In view of these we facilitate our students to understand their strengths, weaknesses and goals so as to convert their dreams to reality. We also give a lot of importance to personality development and building social conscience. It is on account of this that our Technical education has gained importance and the demand is on the rise.

For all these, I have been receiving excellent support and cooperation from all my faculty and staff. In several instances they have also enhanced me to overcome crisis situations and in solving tricky problems. I take up the responsibility to stand as a supporting pillar to the students of MRIET.

Dr. MARAM ASHOK

Principal, MRCE

Editor's Message

As a Editor and the head of the Department CSE, I am extremely happy to bring out this message for the souvenir released on the national level technical fest ,Technology, teaching, training are the pillars of our department, importing the latest technical knowledge to the student and cultivating, nurturing the same in the right way will make our students competent in the competitive world, offers a existing platform for the students to exhibit the knowledge they possess and a good change to develop the same.

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Dr. RadhaDevi
HoD - Department of CSE,

A User-Centric Machine Learning Framework for Cyber Security Operations Center

BONALA NANDA GOPAL, BADHAM RAKESH REDDY, CHIKOTI SAI KUMAR

In order to ensure a company's Internet security, SIEM (Security Information and Event Management) system is in place to simplify the various preventive technologies and flag alerts for security events. Inspectors (SOC) investigate warnings to determine if this is true or not. However, the number of warnings in general is wrong with the majority and is more than the ability of SCO to handle all awareness. Because of this, malicious possibility. Attacks and compromised hosts may be wrong. Machine learning is a possible approach to improving the wrong positive rate and improving the productivity of SOC analysts. In this article, we create a user-centric engineer learning framework for the Internet Safety Functional Center in the real organizational context. We discuss regular data sources in SOC, their work flow, and how to process this data and create an effective machine learning system. This article is aimed at two groups of readers. The first group is intelligent researchers who have no knowledge of data scientists or computer safety fields but who engineer should develop machine learning systems for machine safety. The second groups of visitors are Internet security practitioners that have deep knowledge and expertise in Cyber Security, but do Machine learning experiences do not exist and I'd like to create one by themselves. At the end of the paper, we use the account as an example to demonstrate full steps from data collection, label creation, feature engineering, machine learning algorithm and sample performance evaluations using the computer built in the SOC production of Seyondike.

Cyber Threat Detection Based on Artificial Neural Networks Using Event Profiles

THUMMALA MANOJ KUMAR YADAV, VANGA ANUSHA REDDY, VEMULA SREEJA, AKUTHOTA SAHITH

One of the major challenges in cybersecurity is the provision of an automated and effective cyber-threats detection technique. In this paper, we present an AI technique for cyber-threats detection, based on artificial neural networks. The proposed technique converts multitude of collected security events to individual event profiles and use a deep learning-based detection method for enhanced cyber-threat detection. For this work, we developed an AI-SIEM system based on a combination of event profiling for data pre-processing and different artificial neural network methods, including FCNN, CNN, and LSTM. The system focuses on discriminating between true positive and false positive alerts, thus helping security analysts to rapidly respond to cyber threats. All experiments in this study are performed by authors using two benchmark datasets (NSLKDD and CICIDS2017) and two datasets collected in the real world. To evaluate the performance comparison with existing methods, we conducted experiments using the five conventional machine-learning methods (SVM, k-NN, RF, NB, and DT). Consequently, the

Machine Learning Based Approaches for Detecting COVID-19 using Clinical Text Data

BOMMIREDDY DEEKSHITH, CHALLA ROHITH REDDY, CHERUKURI NISCHAY SAI

Technology advancements have a rapid effect on every field of life, be it medical field or any other field. Artificial intelligence has shown the promising results in health care through its decision making by analysing the data. COVID-19 has affected more than 100 countries in a matter of no time. People all over the world are vulnerable to its consequences in future. It is imperative to develop a control system that will detect the coronavirus. One of the solution to control the current havoc can be the diagnosis of disease with the help of various AI tools. In this paper, we classified textual clinical reports into four classes by using classical and ensemble machine learning algorithms. Feature engineering was performed using techniques like Term frequency/inverse document frequency (TF/IDF), Bag of words (BOW) and report length. These features were supplied to traditional and ensemble machine learning classifiers. Logistic regression and Multinomial Naïve Bayes showed better results than other ML algorithms by having 96.2% testing accuracy. In future recurrent neural network can be used for better accuracy.

Density Based Smart Traffic Control System Using Canny Edge Detection Algorithm for Congregating Traffic Information

PEDDOLLA VIKAS KUMAR, PINNAPU REDDY SAI PRASANNA, POOJARI SOUMIK VARDHAN

As the problem of urban traffic congestion intensifies, there is a pressing need for the introduction of advanced technology and equipment to improve the state-of-the-art of traffic control. The current methods used such as timers or human control are proved to be inferior to alleviate this crisis. In this paper, a system to control the traffic by measuring the real-time vehicle density using canny edge detection with digital image processing is proposed. This imposing traffic control system offers significant improvement in response time, vehicle management, automation, reliability and overall efficiency over the existing systems. Besides that, the complete technique from image acquisition to edge detection and finally green signal allotment using four sample images of different traffic conditions is illustrated with proper schematics and the final results are verified by hardware implementation.

AUTOMATIC DETECTION OF GENETIC DISEASES IN PEDIATRIC AGE USING PUPILLOMETRY

GAJULA NIKHIL

GUJJULA DHARMA REDDY

KOLUVULA NAVYA SRI

MULKALA SHIVAKRISHNA

In this paper, the problem of joint multi-pitch and direction-of-arrival (DOA) estimation for multichannel harmonic sinusoidal signals is considered. A spatio-temporal matrix signal model for a uniform linear array is defined, and then the ESPRIT method based on subspace techniques that exploits the invariance property in the time domain is first used to estimate the multi pitch frequencies of multiple harmonic signals. Followed by the estimated pitch frequencies, the DOA estimations based on the ESPRIT method are also presented by using the shift invariance structure in the spatial domain. Compared to the existing state-of-the- art algorithms, the proposed method based on ESPRIT without 2-D searching is computationally more efficient but performs similarly. An asymptotic performance analysis of the DOA and pitch estimation of the proposed method are also presented. Finally, the effectiveness of the proposed method is illustrated on a synthetic signal as well as real-life recorded data.

DETECTION OF THYROID DISORDERS USING MACHINE LEARNING APPOARCH

EDIGA MEGHANA

GADEGANI SADVIKA

GHANORE AARTHI

GUNDA PAVAN

Classification based Machine learning plays a major role in various medical services. In medical field, the salient and demanding task is to diagnose patient's health conditions and to provide proper care and treatment of the disease at the initial stage. Let us consider Thyroid disease as the example. The normal and traditional methods of thyroid diagnosis involve a thorough inspection and also various blood tests. The main goal is to recognize the disease at the early stages with a very high correctness. Machine learning techniques play a major role in medical field for making a correct decision, proper disease diagnosis and also saves cost and time of the patient. The purpose of this study is prediction of thyroid disease using classification Predictive Modelling followed by binary classification using Decision Tree ID3 and Naive Bayes Algorithms. The Thyroid Patient dataset with proper attributes are fetched and using the Decision Tree algorithm the presence of thyroid in the patient is tested. Further, if thyroid is present then Naïve Bayes algorithm is applied to check for the thyroid stage in the patient.

A Knowledge-Based Recommendation System That Includes Sentiment Analysis And Deep Learning

KOLUVULA NAVYA SRI

POTLA RAVI TEJA REDDY

SHERUGUDEM VIVEK

Online social networks (OSN) provide relevant information on users' opinion about different themes. Thus, applications, such as monitoring and recommendation systems (RS) can collect and analyse this data. This paper presents a Knowledge-Based Recommendation System (KBRS), which includes an emotional health monitoring system to detect users with potential psychological disturbances, specifically, depression and stress. Depending on the monitoring results, the KBRS, based on ontologies and sentiment analysis, is activated to send happy, calm, relaxing, or motivational messages to users with psychological disturbances. Also, the solution includes a mechanism to send warning messages to authorized persons, in case a depression disturbance is detected by the monitoring system. The detection of sentences with depressive and stressful content is performed through a Convolutional Neural Network (CNN) and a Bi-directional Long Short-Term Memory (BLSTM) - Recurrent Neural Networks (RNN); the proposed method reached an accuracy of 0.89 and 0.90 to detect depressed and stressed users, respectively. Experimental results show that the proposed KBRS reached a rating of 94% of very satisfied users, as opposed to 69% reached by a RS without the use of neither a sentiment metric nor ontologies. Additionally, subjective test results demonstrated that the proposed solution consumes low memory, processing, and energy from current mobile electronic devices.

Missing Child Identification System using Deep Learning and Multiclass SVM

M MAHESHWAR

MAHAMMAD ANEES

MUNTHALA VANDANA

MUSINI PAVAN

MUSKAN

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.

USING DEEP LEARNING TO PREDICT PLANT GROWTH AND YIELD IN GREENHOUSE ENVIRONMENTS

A VENKATA SIVA NAGA MANIKANTA

AENUGU ANUSHA

ALLATIPALLI PRABHAKAR REDDY

BANDELA PRAGATHI

Effective plant growth and yield prediction is an essential task for greenhouse growers and for agriculture in general. Developing models which can effectively model growth and yield can help growers improve the environmental control for better production, match supply and market demand and lower costs. Recent developments in Machine Learning (ML) and, in particular, Deep Learning (DL) can provide powerful new analytical tools. The proposed study utilises ML and DL techniques to predict yield and plant growth variation across two different scenarios, tomato yield forecasting and Ficus benjamina stem growth, in controlled greenhouse environments. We deploy a new deep recurrent neural network (RNN), using the Long Short-Term Memory (LSTM) neuron model, in the prediction formulations. Both the former yield, growth and stem diameter values, as well as the microclimate conditions, are used by the RNN architecture to model the targeted growth parameters. A comparative study is presented, using ML methods, such as support vector regression and random forest regression, utilising the mean square error criterion, in order to evaluate the performance achieved by the different methods. Very promising results, based on data that have been obtained from two greenhouses, in Belgium and the UK, in the framework of the EU Interreg SMARTGREEN project (2017-2021), are presented.

Facial Expression Recognition And Their Temporal Segments From Face Profile Image Sequences Using Yolo Object Detection Algorithm

KAMAL SINGH BISTA

KONADODDI PRAVALIKA

KORRU PRIYANKA

KUNDETI NANDINI

Now-a-days with the continued development of artificial intelligence facial emotion recognition has become more popular. The emotion recognition plays a major role in interaction technology. In interaction technology the verbal components only play a one third of communication and the non-verbal components plays a two third of communication. A facial emotion recognition (FER) method is used for detecting facial expressions. Facial expression plays a major role in expressing what a person feels and it expresses inner feeling and his or her mental situation or human perspective. This paper aims to identify basic human emotions with the combination of gender classification and age estimation. The facial emotions such as happy, sad, angry, fear, surprised, neutral emotions are considered as basic emotions. Here proposes a real time facial emotion recognition system based on You Look Only Once (YOLO) version 2 architecture and a squeezenet architecture. The yolo architecture is a real time object detection system. Here it used for identify and detect faces in real time. These images are captured by using anchor boxes for accuracy. The second architecture is squeezenet and is used for gender classification and age estimation.

Machine Learning for Web Vulnerability Detection: The Case of Cross-Site Request Forgery

PALLE SRAVYA
PATRI DHANUNJAY
PENDLI HARIKA
PRAVEEN KUMAR BANGARU

In this project, we propose a methodology to leverage Machine Learning (ML) for the detection of web application vulnerabilities. Web applications are particularly challenging to analyses, due to their diversity and the widespread adoption of custom programming practices. ML is thus very helpful for web application security: it can take advantage of manually labeled data to bring the human understanding of the web application semantics into automated analysis tools. We use our methodology in the design of Mitch, the first ML solution for the black-box detection of Cross-Site Request Forgery (CSRF) vulnerabilities. Mitch allowed us to identify 35 new CSRFs on 20 major websites and 3 new CSRFs on production software.

Intelligent Agent based Job Search System

M**.ASHOK KUMAR**
MUNUGAL SUNNY
PIDUGU SURESH
K SAI MANIKANTA

Finding jobs that best suits the interests and skill set is quite a challenging task for the job seekers. The difficulties arise from not having proper knowledge on the organisation's objective, their work culture and current job openings. Summer jobs are becoming year round side work. Even I'm rolling up my sleeves on the path of researching the best apps that will put to work on tasks, jobs and chores in one's extra time. We set the hours and the amount of time you want to carve out for this side work. An app for finding small paid work in your local area. It is for users who are in need of some quick cash and willing to do small works like repairing a computer, babysitting, mowing a lawn and other similar tasks.

Exploratory Visual Sequence Mining Based on Pattern-Growth

N.SAI CHANDRA
N ASEEL IQBAL
AKULA RANI

Abstract—Sequential pattern mining finds applications in numerous diverging fields. Due to the problem's combinatorial nature, two main challenges arise. First, existing algorithms output large numbers of patterns many of which are uninteresting from a user's perspective. Second, as datasets grow, mining large numbers of patterns gets computationally expensive. There is, thus, a need for mining approaches that make it possible to focus the pattern search towards directions of interest. This work tackles this problem by combining interactive visualization with sequential pattern mining in order to create a "transparent box" execution model. We propose a novel approach to interactive visual sequence mining that allows the user to guide the execution of a pattern-growth algorithm at suitable points through a powerful visual interface.

Predicting Stock Market Trends Using Machine Learning and Deep Learning Algorithms Via Continuous and Binary Data; a Comparative Analysis

MUTHINENI RAHUL
SHAIK NAGUL MEERA
ANAGANDULA PAVAN KUMAR

The nature of stock market movement has always been ambiguous for investors because of various influential factors. This study aims to significantly reduce the risk of trend prediction with machine learning and deep learning algorithms. Four stock market groups, namely diversified financials, petroleum, non-metallic minerals and basic metals from Tehran stock exchange, are chosen for experimental evaluations. This study compares nine machine learning models (Decision Tree, Random Forest, Adaptive Boosting (Adaboost), eXtreme Gradient Boosting (XGBoost), Support Vector Classifier (SVC), Naïve Bayes, K-Nearest Neighbors (KNN), Logistic Regression and Artificial Neural Network (ANN)) and two powerful deep learning methods (Recurrent Neural Network (RNN) and Long short-term memory (LSTM).

Ten technical indicators from ten years of historical data are our input values, and two ways are supposed for employing them. Firstly, calculating the indicators by stock trading values as continuous data, and secondly converting indicators to binary data before using. Each prediction model is evaluated by three metrics based on the input ways. The evaluation results indicate that for the continuous data, RNN and LSTM outperform other prediction models with a considerable difference. Also, results show that in the binary data evaluation, those deep learning methods are the best; however, the difference becomes less because of the noticeable improvement of models' performance in the second way.

Robust Malware Detection for Internet Of (Battlefield) Things Devices Using Deep Eigenspace Learning

DENDUKRI SAI KIRAN VARMA
DEVARAPALLI SAI KRISHNA
DHODI SHIVA KUMAR NANDISH

Internet of Things (IoT) in military settings generally consists of a diverse range of Internet-connected devices and nodes (e.g. medical devices and wearable combat uniforms). These IoT devices and nodes are a valuable target for cyber criminals, particularly state-sponsored or nation state actors. A common attack vector is the use of malware. In this paper, we present a deep learning based method to detect Internet Of Battlefield Things (IoBT) malware via the device's Operational Code (OpCode) sequence. We transmute OpCodes into a vector space and apply a deep Eigenspace learning approach to classify malicious and benign applications. We also demonstrate the robustness of our proposed approach in malware detection and its sustainability against junk code insertion attacks. Lastly, we make available our malware sample on Github, which hopefully will benefit future research efforts (e.g. to facilitate evaluation of future malware detection approaches).

OBJECT CLASSIFICATION USING CNN-BASED FUSION OF VISION AND LIDAR IN AUTONOMOUS VEHICLE ENVIRO

VELPULA SIDDUBABU
VENNAPUSA SAI REDDY
YERRAMREDDY SAITEJA

This paper presents an object classification method for vision and light detection and ranging fusion of autonomous vehicles in the environment. This method is based on convolutional neural network (CNN) and image upsampling theory. By creating a point cloud of LIDAR data upsampling and converting into pixel-level depth information, depth information is connected with Red Green Blue (RGB) data and fed into a deep CNN. The proposed method can obtain informative feature representation for object classification in autonomous vehicle environment using the integrated vision and LIDAR data. This method is also adopted to guarantee both object classification accuracy and minimal loss. Experimental results are presented and show the effectiveness and efficiency of object classification strategies.

Institution Vision & Mission

Vision

- To emerge as a Centre of Excellence for producing professionals who shall be the leaders in technology innovation, entrepreneurship, management and in turn contribute for advancement of society and human kind.

Mission

- **M1 :** To provide an environment of learning in emerging technologies.
- **M2 :** To nurture a state of art teaching learning process and R&D culture.
- **M3 :** To foster networking with Alumni, Industry, Institutes of repute and other stakeholders for effective interaction.
- **M4 :** To practice and promote high standards of ethical values through societal commitment.

Department of Computer Science and Engineering

Department Vision & Mission

Vision

- To impart futuristic knowledge in Computer Science and to produce highly skilled, imaginative and socially mindful experts who can contribute to industry and architect research fit for working in worldwide condition.

Mission

- To promote strong academic growth by providing fundamental domain knowledge and offering state of art technology for having an excellence in research & development.
- To create an environment for learning analytical skills, advanced programming languages using modern tools and to equip for higher studies.
- To undertake collaborative projects for understanding need of team work in real time environment and to improve communication and inter personnel skills for better employability.
- To promote high standards of ethical values through societal commitment.

Computer Science & Engineering PO's

Engineering Graduates will be able to:

- **PO.1.Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- **PO.2.Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO.3.Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO.4.Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- **PO.5.Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- **PO.6.The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- **PO.7.Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- **PO.8.Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- **PO.9.Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- **PO.10.Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

- **PO.11.Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- **PO.12.Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Computer Science & Engineering PEO's

- **PEO1 –** To make the students understand and implement the engineering concepts in multiple domains.
- **PEO2 –** To provide knowledge based services so as to meet the needs of the society and industry by usage of modern tools.
- **PEO3 –** To understand engineering processes for design and development of software components and products efficiently for improving employability.
- **PEO4 –** To educate students in disseminating the research findings to create interest for higher studies.
- **PEO5 –** To inculcate knowledge with due consideration for ethical and economic issues.

Computer Science & Engineering PSO's

- **PSO1:** Professional Skills: The ability to understand, analyze and develop computer programs in the areas related to algorithms and System Software.
- **PSO2:** Problem Solving Skills: The ability to apply standard practices and strategies in software project development to deliver a quality and defect free product.
- **PSO3:** Employability Skills: The ability to employ modern computer languages and technologies, so as to be industry ready and for better employability and research.