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Track VIII

Secure Communication using Cryptography and Image Hiding Technique

V Divya

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Abstract:

This paper proposes a method for secure and subtle communication between two users, utilizing cryptography and image hiding techniques. The sender encrypts the information using triple DES algorithm, and hides the encrypted data in an image using the RDH method, where a hidden key is automatically generated by the system. The sender then sends the image through the current mail framework. The receiver can only access the original data if they have the data hiding and decoding key, otherwise they will only be able to see the original image. The system also provides protection for the key through a proper login process. The system generates fake data if the user is not authenticated during the login process, ensuring that only authorized users can access the original data.

Keywords: data encryption; reverse data hiding technique; steganography; triple data encryption standard

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Track VIII

Enhancing Cloud Storage Efficiency through File-Level Deduplication and Compression Techniques

P M Ashok

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Abstract:

Cloud computing has revolutionized internet-based computing by providing various applications and hardware to end-users. Existing systems use block-level deduplication, where unique chunks of data or byte patterns are identified and stored in the cloud file system. However, maintaining a large number of blocks is difficult and requires high processing power. In this paper, we propose a file-level deduplication and compression approach to enhance cloud storage efficiency. Our approach stores only a single copy of redundant data and detects the presence of duplicate files, which are then stored in a compressed format in all other servers, improving efficiency and increasing availability. The files can be uncompressed and downloaded by the user, maximizing storage efficiency. This approach eliminates replication, which leads to space wastage, and avoids single point failure, enhancing the overall efficiency of cloud storage.

Keywords: Cloud storages; Cloud-computing; Compression techniques; Deduplication; End-users; Existing systems; File levels; Internet based computing; Storage efficiency; Storage performance

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Track VIII

Predicting User Ratings in Hotel Reviews Using Sentiment Analysis and Natural Language Processing

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Abstract:
The internet has given users the freedom to express their opinions, which play a crucial role in shaping the service industry. Extracting hidden information and feelings from user reviews can provide insights to better serve their needs and stay competitive. This paper proposes a methodology to predict the rating of a review based on sentiment analysis and the magnitude of the sentence using the bag-of-words approach in natural language processing. The experimental classification considers a scale of one to five and uses a dataset of hotel reviews from Datafiniti. Results show that approximately 60% of the ratings can be predicted, while 40% remain unpredictable. This research highlights the potential of natural language processing and sentiment analysis in predicting user ratings to improve the service industry.

Keywords: internet, user reviews, service industry, sentiment analysis, natural language processing, rating prediction, bag-of-words, Datafiniti.

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Track VIII

A Discovery Technique for Interest Flooding Attack Detection in Named Data Networking

V Bhavani

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Abstract:

This paper proposes a detection technique for interest flooding attacks (IFA) in Named Data Networking (NDN) using a chi-square test and similarity test. The technique determines the detection window size based on data entropy in the current network traffic. Attackers may add a random suffix to a legitimate prefix and flood the network with interest packets that do not receive a response. To detect this, the chi-square test is used to identify changes in the prefix of interest packets. Additionally, the similarity of interest packet prefixes is determined. The results of both approaches are combined to detect IFA attacks. Based on the symmetric routing rule of the Pending Interest Table (PIT), the forged interest packet is sent back to the attacker, and the corresponding port of the attacker is restricted to suppress the IFA attack effectively. Experimental results demonstrate that the proposed technique can detect IFA at the beginning of the attack and is more accurate and effective than other methods. This research highlights the potential of using statistical tests for detecting interest flooding attacks in NDN.

Keywords: Chi-square test; Information entropy; Interest flooding attack; Named data networking; Self-similarity

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Track VIII

Preventing Sybil Attacks in VANETs Using Machine Learning-Based SDTC Method

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Abstract:

The abstract presents VANET as a subclass of MANET, where vehicles connect via node-to-node or roadside equipment, but face security threats such as Sybil attacks. The Sybil attack involves the creation of fictitious identities by attackers to undermine the network's value. This attack affects carrier transportation, including road safety, traffic congestion, and multimedia entertainment. To counter this, the SDTC method is proposed, which relies on machine learning techniques to detect Sybil attacks. The method utilizes vehicle-specific Extreme Learning Machine (ELM) features to enhance scalability and detection accuracy while reducing identification time. The results show that SDTC is an effective strategy to prevent Sybil attacks and maintain provider service in VANETs.

Keywords: VANET, MANET, Sybil attacks, SDTC, machine learning, Extreme Learning Machine (ELM), scalability, detection accuracy, identification time.

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Track VIII

A Review of Segmentation Techniques for Medical Image Analysis

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Abstract:
Medical image segmentation is a crucial step in modern medical image analysis, as it enables the detection of issues that would otherwise be difficult to identify. Segmentation involves dividing the processed image into segments and reducing noise, which is essential for the development of medical imaging. Technical advancements have accelerated image processing and enabled closer pixel analysis, making segmentation even more critical. Segmentation techniques can identify flaws and anomalies in medical images, which would be challenging to spot in raw images. This paper presents a comprehensive review of the best segmentation techniques for medical image analysis. Each technique's scope, potential applications, and noise reduction capabilities are described in detail. The paper also examines the reliability and applicability of the methods, considering their precision and accuracy.

Keywords: medical image segmentation, medical image analysis, noise reduction, segmentation techniques, precision, accuracy, review.

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Track VIII

SECOND INTERNATIONAL CONFERENCE ON ELECTRICAL ELECTRONICS AND COMPUTER COMMUNICATION ENGINEERING 2023

Multi-Viewpoint-Based Visual Assessment of Cluster Tendency for eHealth Text Mining Domains

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Abstract:

The accurate assessment of clusters is essential for effective eHealth text mining, and cosine-based visual methods (VM) have been found to be more accurate than Euclidean-based methods for tweet data models. However, single-viewpoint assessments can be less informative, and multi-viewpoint (MVP) assessments are necessary for a more comprehensive understanding of cluster tendency in health-care tweet documents. In this study, the authors propose MVP-based VM, using traditional topic models with visual techniques to identify cluster tendency, partitioning for cluster validity, and propose health-care recommendations based on tweets. The proposed methods are demonstrated on real-time Twitter health-care data sets, and a comparative analysis with existing visual assessment tendency (VAT) and cVAT models is presented. The results suggest that the MVP VM approach is more informative and effective in assessing cluster tendency in eHealth text mining domains. The authors also introduce the multi-viewpoints distance metric for topic model cluster tendency and hybrid topic models for visual representation, adding to the originality and value of this paper.

Keywords: eHealth, text mining, cluster assessment, cosine-based visual methods, multi-viewpoint assessment, topic models, Twitter, health-care data, cluster validity, hybrid topic models.

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Track VIII

Exploring Data Cluster Tendency for Big Data: A Sampling-Based Crisp Partition Approach for BigVAT Clustering

B. Chaitanya Krishna
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Abstract:
Cluster analysis is an essential task in big data analysis, and cluster tendency assessment is crucial for determining the appropriate number of clusters. Several visualization techniques have been developed for cluster tendency detection, including Visual Assessment Tendency (VAT), spectral-based VAT (SpecVAT), and improved VAT (iVAT), which have been successful for small datasets. However, bigVAT is a recent method that is ideal for estimating cluster tendency in large datasets. Nevertheless, it is challenging to explore data clusters for large volumes of data objects. To address this, this paper proposes a sampling-based crisp partition approach for bigVAT clustering, which accurately predicts cluster labels for data objects. The proposed approach is evaluated using big synthetic and real-life datasets to demonstrate its performance efficiency.

Keywords: Cluster analysis, cluster tendency, big data analysis, visualization techniques, VAT, spectral-based VAT, improved VAT, bigVAT, sampling-based crisp partition approach.

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Track VIII

Rule-based Extraction of Test Information from UML Sequence Diagram for Combinatorial Testing using Optimization Algorithms: A Case Study on Indian Railways Concession Management Subsystem

V. Chandra Prakash

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Abstract:

Combinatorial Testing is crucial for detecting defects resulting from interactions among input parameters in software systems. However, the manual input of parameters, values, and constraints makes it challenging to generate combinatorial test cases. In this paper, the authors propose a novel approach for generating combinatorial test cases from UML Sequence Diagrams using the Combinatorial Test Design Model (CTDM). The authors use a rule-based algorithm to extract information related to CTDM from UML Sequence Diagrams, which includes input parameters, values, and constraints. Combinatorial test cases are then generated using optimization algorithms, specifically Particle Swarm Optimization and Simulated Annealing. The proposed approach is applied to the Concession Management Subsystem of Indian Railways, and the authors recommend using All Combination testing, Particle Swarm Optimization, and Simulated Annealing algorithms for generating a minimum number of combinatorial test cases for simple, moderate, and complex UML Sequence Diagrams. The significant contributions of this research are the rule-based extraction of test information from UML Sequence Diagrams and the generation of combinatorial test cases using optimization algorithms. This research work can aid in the management of Indian Railways, and the proposed approach can be applied to other software systems.

Keywords: Combinatorial Testing, UML Sequence Diagrams, Combinatorial Test Design Model, optimization algorithms, Particle Swarm Optimization

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Track VIII

Analysis of Peak to Side-Lobe Ratio for Hypernasality Detection Using Linear Prediction Residual Hilbert Envelope

Akhilesh Kumar Dubey
Department of CSE, Koneru Lakshmaiah Education Foundation, Vaddeswaram, AP, India.

Abstract:
Hypernasality detection is crucial in diagnosing speech disorders. This study proposes using the peak to side-lobe ratio (PSR) around each glottal closure instant (GCI) in the Hilbert envelope (HE) of linear prediction (LP) residual as a cue for hypernasality detection. The PSR is affected by the coupling between nasal and oral tracts during the production of voiced sound in hypernasal speech. The LP model is poor in modeling the zeros in the spectrum added by the nasal tract, resulting in increased side-lobe strength around the peak in the HE of LP residual. Classification between normal and hypernasal sound based on a threshold value of PSR shows an accuracy of 70.49%, 78.19%, 63.15%, 60.67%, and 67.27% for high vowel, low vowel, glides, liquids, and voicebar sounds, respectively. The proposed method offers a promising approach for hypernasality detection.

keywords: Hypernasality, peak to side-lobe ratio, glottal closure instant, Hilbert envelope, linear prediction, speech disorders.

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Track VIII

Enhancing Leukemia Diagnosis through Deep Learning-Based Classification of B-Lymphoblasts

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Abstract:
Leukemia is a type of cancer that affects the blood, impacting the lymphatic system and bone marrow, and leading to an overproduction of abnormal white blood cells that replace the healthy ones. Unlike other cancers, leukemia does not produce solid tumors, making diagnosis through manual examination of blood samples a challenging task for experts. Machine learning algorithms have been widely used to assist in the classification of different types of leukemia and aid in its early detection.This study proposes modifications to conventional neural network topologies to improve the performance of machine learning algorithms in the accurate and reliable recognition of malignant and non-malignant cells in leukemia diagnosis. Data augmentation methods and transfer learning techniques were utilized to develop a deep learning model for the classification of leukemic B-lymphoblasts. The proposed approach outperformed separate networks, achieving a test accuracy of 95.59%. The deep learner was able to merge characteristics extracted from top-performing deep learning models, providing a trustworthy and accurate means for leukemia diagnosis.This research highlights the potential of deep learning-based approaches in enhancing leukemia diagnosis and improving patient outcomes. By automating the detection of leukemia through computer-aided diagnostic (CAD) models, this technology can assist doctors in early identification and treatment of leukemia. These findings provide promising opportunities for the development of efficient and reliable diagnostic tools for leukemia and other types of cancer.

keywords: leukemia, cancer, blood, lymphatic system, bone marrow, machine learning, neural network, deep learning, data augmentation, transfer learning, diagnosis, computer-aided diagnosis, CAD, early detection, patient outcomes.

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Track VIII

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Development of a Continuous Speech Recognition System for Assamese Language Using Deep Neural Networks

Samudravijaya
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Abstract:
This research paper presents the development of a continuous speech recognition system for Assamese, an under-resourced language of North-East India. The speech corpus used in this work consists of 5658 spoken utterances collected from 27 speakers over a telephone channel. The conventional hidden Markov model in conjunction with Gaussian mixture model, employing Mel-frequency cepstral coefficients as features, was used to implement the baseline speech recognition system. Additionally, ASR systems using subspace Gaussian mixture model and deep neural networks in conjunction with hidden Markov model were also implemented. The systems were evaluated using the 3-fold cross-validation method, and the best ASR system achieved an average word error rate of 4.3%. The results demonstrate the effectiveness of the deep neural network approach for the development of an accurate and reliable continuous speech recognition system for the Assamese language.

Keywords: Continuous speech recognition, Assamese language, hidden Markov model, Gaussian mixture model, Mel-frequency cepstral coefficients, subspace Gaussian mixture model, deep neural networks, word error rate.

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Track VIII

Intelligent System for Diabetic Patient Tracking using Machine Learning and Advanced-Spatial-Vector-Based Random Forest

Prashanth Kumar Shukla
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Abstract:
Continuous surveillance is critical for people with diabetes, and modern technologies such as the Internet of Things (IoT), advanced communications, and artificial intelligence (AI) can help lower healthcare costs. However, the growing healthcare data makes storage and processing a significant challenge. In this paper, we propose an intelligent healthcare system that utilizes machine learning (ML) to track diabetic patients. The system consists of smartphones, sensors, and smart devices to gather body dimensions, which are then normalized using the normalization procedure. Linear discriminant analysis (LDA) is employed to extract features, and the suggested advanced-spatial-vector-based Random Forest (ASV-RF) in conjunction with particle swarm optimization (PSO) is used for data classification. The proposed system demonstrates greater accuracy compared to other techniques. To meet important requirements like large bandwidth and excellent energy efficiency, the 5G network must offer advanced healthcare services.

Keywords: Continuous surveillance, diabetes, Internet of Things (IoT), artificial intelligence (AI), machine learning (ML), smartphones, sensors, smart devices, body dimensions, normalization, Linear discriminant analysis (LDA), advanced-spatial-vector-based Random Forest (ASV-RF)

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Track VIII

Probabilistic Adaptive Algorithms for Improving Flash Memory-based Solid State Drives Performance

Thakare Atul O
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Abstract:
Solid State Drives (SSDs) based on flash memory have become an important part of computer storage hierarchy due to their high read performance and low power consumption. However, the asymmetric I/O latencies for read, write, and erase operations pose a challenge for overall performance. In this paper, we propose two novel probabilistic adaptive algorithms that consider the probability of reference based on recency, frequency, and periodicity of past page references. Our approach takes into account the asymmetric read-write-erase properties of flash devices and caches pages based on their probability of reference. Page replacement is also performed based on the probability of reference of cached pages. We evaluate our proposed method using experimental results and show that it successfully minimizes performance overheads and maintains a good hit ratio. Our results also demonstrate the utility of a genetic algorithm in maximizing overall performance gains.

Keywords: Solid State Drives, flash memory, I/O latencies, read performance, write performance, erase performance, probabilistic adaptive algorithms, recency, frequency

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Track VIII

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A Novel Image Tamper Detection and Correction Technique Using Differencing and Root of Merkle Tree

Devi Kosuru S.N.V.J.

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Abstract:

This paper presents a novel image tamper detection and correction technique that uses differencing and the root of Merkle tree. The technique operates on 2 × 2 non-overlapping blocks, where each pixel's decimal value for the 4 most significant bits (MSBs) is referred to as the quotient, and the decimal value for the 4 least significant bits (LSBs) is called the remainder. The watermark bits (WBs) are computed from 4 quotients using the root of the Merkle tree. These 4 WBs are XORed with 4 bits generated from the logistic map sequence to produce 4 recovery bits (RBs). The 4 WBs and 4 RBs are stored in 4 remainders using LSB alteration and remainder value differencing (RVD). The proposed technique achieves a peak signal-to-noise ratio (PSNR) value of 42.02 dB and a structural similarity (SSIM) index value of 0.9765. The tampered blocks can be accurately identified and corrected, making the technique highly effective for image tamper detection and correction.

Keywords: Image tamper detection, Image tamper correction, Differencing, Merkle tree, LSB alteration, Recovery bits

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Track VIII

A Constructive Hierarchical Data Sharing Method for Ensuring Security and Privacy in Cloud Computing

Rajesh Bingu
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Abstract:
As the use of cloud computing continues to grow, there is a need for secure and efficient data sharing among multiple users. However, ensuring the integrity, privacy, and confidentiality of sensitive data and the hierarchical model can be complex. In this research, we propose a Constructive Hierarchical Data Sharing (CHDS) method that uses symmetric encryption over a rooted hierarchical graph structure to ensure the security and privacy of shared data. The hierarchical graph model analyzes incoming data features to establish the model's privacy and authenticity. The proposed CHDS is transparent, secure, and effective in a public environment, and it provides a better trade-off when compared to various existing approaches. Performance metrics, such as computational complexity, key generation, prediction accuracy, and execution time, are evaluated. The results demonstrate that the proposed CHDS maintains security in multi-party environments without sacrificing valuable resources, even as the hierarchical model grows in size. Overall, our proposed method offers an effective solution for hierarchical data sharing in cloud computing environments.

Keywords: Cloud computing, Data sharing, Hierarchical model, Symmetric encryption, Computational complexity, Prediction accuracy, Execution time

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Track VIII

Improved Variants of Twin Bounded Large Margin Distribution Machine for Classification

Hazarika, Barenya Bikash
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Abstract:
The twin bounded large margin distribution machine (TBLDM) is a robust and effective classifier that uses twin bounded support vector machine (TBSVM) and large margin distribution machine (LDM). TBLDM finds two nonparallel hyperplanes by optimizing the negative and positive margin distributions. This paper proposes two improved variants of TBLDM: the least squares TBLDM (LSTBLDM) and iterative TBLDM (ITBLDM). LSTBLDM solves a system of linear equations, unlike TBLDM, by using equality constraints in the optimization problem. ITBLDM solves optimization problems in primal using a simple iterative scheme. The proposed models are easily implementable as pseudo-codes are provided. The experiments were conducted on one artificial and thirty-eight real-world datasets, and the proposed models were compared with the least squares support vector machine (LSSVM), twin support vector machine (TWSVM), and TBLDM. The results show that LSTBLDM and ITBLDM have better classification accuracy and are more applicable and useful than the compared models. This research contributes to the field of classification and can be used in various applications such as image recognition and data mining.

Keywords: Twin bounded large margin distribution machine (TBLDM), twin bounded support vector machine (TBSVM), large margin distribution machine (LDM), least squares TBLDM (LSTBLDM), iterative TBLDM (ITBLDM), least squares support vector machine (LSSVM), twin support vector machine (TWSVM), classification, optimization, linear equations, artificial datasets, real-world datasets, classification accuracy, image recognition, data mining**.**

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Track VIII

Enhanced Chaotic Map-Based Multiple Image Encryption Scheme

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Abstract:
This paper presents a secure and efficient multiple-image encryption scheme based on an enhanced chaotic map. The scheme combines multiple grayscale images into three planes and utilizes an amplified sine map to generate a dynamic permutation table and a chaotic sequence. The initial parameters of the amplified sine map are obtained using elliptic curve point multiplication between the input image hash value and an elliptic curve's seed value. The dynamic permutation table performs cyclic shift transformation on the input image, diffusing it horizontally and vertically. The diffused image is converted into a cipher image through an XOR operation with the chaotic sequence generated by the amplified sine map. The use of an amplified sine map provides a larger key space, better sensitive initial values, and enhanced security against cryptanalysis. Experimental results demonstrate that the proposed scheme is fast, efficient, and can resist certain cryptographic attacks. Moreover, the proposed scheme outperforms other recent schemes in terms of security and efficiency.

Keywords: multiple-image encryption, enhanced chaotic map, grayscale images, amplified sine map, dynamic permutation table, elliptic curve point multiplication, input image hash value, key space, sensitive initial values, security, cryptanalysis, XOR operation

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Track VIII

Automatic Detection of Diabetic Retinopathy: A Review of Current Approaches and Challenges

C. Divya
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Abstract:
Diabetic Retinopathy (DR) is a growing concern worldwide, caused by high glucose levels that damage the retina and lead to vision loss. T2D with impaired vision is a sign of DR, which can develop in individuals with T1D for over six years. Early detection of DR is crucial in preventing irreversible eyesight loss, particularly for those who developed diabetes in childhood or adolescence. However, previous detection techniques are time-consuming and prone to errors. This review paper examines current approaches for automatic DR detection using computerized diagnostics, with a focus on performance improvement and associated challenges. The authors provide a comprehensive overview of the topic, highlighting the importance of early diagnosis and the potential for computerized diagnostics to enhance detection accuracy and efficiency.

Keywords: Diabetic Retinopathy, Type I Diabetes, Type II Diabetes, Vision Loss, Computerized Diagnostics, Early Diagnosis, Performance Improvement

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Track VIII

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Machine learning-based approach forecasting of Ionospheric–TEC during 24th solar cycle

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Abstract:

Machine learning of GPS TEC is a promising approach for real-time monitoring and forecasting of the Earth's ionosphere. By leveraging the power of data-driven techniques, we can extract valuable information from the raw GPS TEC data and improve the accuracy and reliability of the ionospheric models. However, there are still some challenges and limitations that need to be addressed in future research, such as handling missing data, developing hybrid models, and improving interpretability. The potential applications of GPS TEC prediction in various fields also highlight the importance and urgency of advancing the machine learning techniques in this area. Despite the promising results of machine learning in GPS TEC prediction, there are still some challenges and limitations that need to be addressed in future research. One of the main challenges is the handling of missing data, which is common in GPS TEC measurements due to various factors, such as satellite outage and data transmission errors. Another challenge is the development of hybrid models that can combine the strengths of different machine learning techniques and incorporate physical knowledge and constraints. Moreover, improving the interpretability and explainability of the machine learning models is also an important research direction, especially in critical applications such as space weather monitoring and forecasting..

Keywords: Brain GPS–TEC, Machine Learning , Navigation , Space Weather

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Track VIII

Machine learning-based approach for modeling of TEC during storm conditions

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Abstract:

The Earth's ionosphere is a complex and dynamic plasma environment that affects various radio wave propagation and communication systems. GPS TEC is a measure of the electron density along the path of GPS signals, which can reflect the ionospheric state and variations. Global Positioning System (GPS) Total Electron Content (TEC) is a useful parameter for studying the Earth's ionosphere. Machine learning techniques have been widely applied in GPS TEC prediction, which can provide fast and accurate TEC values for real-time monitoring and forecasting. In this paper, we present a review of recent advances in machine learning of GPS TEC, including data preprocessing, feature engineering, and model selection. We summarize the main challenges and future research directions in this field, such as handling missing data, developing hybrid models, and improving interpretability. We also discuss the potential applications of GPS TEC prediction in various fields, such as space weather monitoring, ionospheric modeling, and GNSS-based positioning and navigation. However, these methods are computationally expensive and require a priori information about the ionospheric parameters. Machine learning techniques, on the other hand, can learn the underlying patterns and relationships from the raw GPS TEC data without explicit modeling assumptions.

Keywords: GPS, TEC, Machine Learning , Strom, Navigation, Space Weather

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Track VIII

Cognitive Radio Optimal spectrum and power allocation using optimal numerical methods

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Abstract:
Optimal spectrum and power allocation refers to the process of efficiently assigning available frequencies and power levels to different communication channels, in order to maximize overall system performance. This involves a complex optimization problem, as the allocation decisions must take into account factors such as signal strength, interference, and bandwidth constraints. Optimization techniques can be used to solve this problem, by formulating the allocation decision as a mathematical optimization problem and finding the optimal solution through numerical methods. This involves defining an objective function that captures the desired system performance metric, such as data rate or signal-to-noise ratio, and specifying constraints on the available resources. The optimal solution will depend on the specific requirements and constraints of the communication system, and may involve trade-offs between different performance metrics. By using optimization techniques to find the best possible allocation, it is possible to improve the overall efficiency and effectiveness of the communication system, leading to better performance and user experience.

Keywords: Communication, spectrum, and power, Optimization

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Track VIII

Forecasting of Ionospheric–Time delays based on Adjusted Spherical Harmonic Analysis

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Abstract:

Forecasting time delays is an important task in various fields, including satellite communication, geodesy, and global navigation. In this study, we propose a method based on adjusted spherical harmonic analysis for forecasting time delays. The method involves fitting a spherical harmonic model to time series data of the delays and then adjusting the coefficients of the model using a least squares approach. We then use the adjusted model to forecast future time delays. We demonstrate the effectiveness of our method by applying it to GPS data collected from several sites around the world. The results show that our method can accurately forecast time delays with a high level of precision, even when the data is noisy or has missing values. We also compare our method to several other popular methods for forecasting time delays and find that our method outperforms them in terms of accuracy and robustness. Overall, our method provides a reliable and efficient way to forecast time delays in various applications. Future work could include exploring the use of additional data sources, such as weather or atmospheric models, to further improve the accuracy of our method.

Keywords: Forecasting, global navigation, adjusted spherical harmonic analysis

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Track VIII

Design and Analysis of Modified DGS-based monopole circular-shaped patch antenna for 5GApplications

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Abstract:
An abstract monopole circular-shaped antenna is a type of antenna that is designed for use in 5G communication systems. It is a vertical antenna that consists of a circular-shaped radiating element, a ground plane, and a feed point. The circular shape of the radiating element allows for omnidirectional radiation, meaning that it can transmit and receive signals in all directions. This type of antenna is commonly used in 5G communication systems because it is compact and has a low profile, making it easy to install in urban areas with limited space. Additionally, the circular shape of the radiating element allows for efficient use of spectrum, which is important for high-speed data transmission in 5G networks. The gains are 8.5 dBi, 8.2 dBi for the two resonant frequencies, and the radiation patterns are semi-omnidirectional, and omnidirectional. The proposed antenna has been validated by observing good agreement between the simulation and the measured results overall, the abstract monopole circular-shaped antenna is an important component of 5G communication systems, allowing for efficient and reliable wireless communication in a variety of settings

Keywords: Circular patch · Defected ground structure (DGS) · Monopole · Ultra-wideband (UWB) · Wireless applications

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Track VIII

Design and Analysis of Ionospheric monitoring system for real-time monitoring

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Abstract

The Ionospheric Global Positioning System (GPS) is a technology that uses signals from GPS satellites to provide location information. The Internet of Things (IoT) is a network of devices that are connected to each other and can exchange data. The combination of these two technologies has led to the development of the Ionospheric GPS IoT, which enables real-time monitoring and tracking of various assets and devices. Ionospheric signal delay/Total Electronic Content (TEC) data from GNSS stations, Koneru Lakshmaiah Education Foundation (KLEF)—Guntur (16.44° N, 80.62° E, geographical), are used for analysis during the 2016 period. As a result, the cloud-based monitoring system reduces operating costs, backs up and retrieves data. It optimizes productivity and collaboration around the world via the Internet. This abstract summarizes the potential benefits and challenges of implementing the Ionospheric GPS IoT, including increased accuracy and efficiency in location tracking, as well as potential interference from natural phenomena such as solar flares and geomagnetic storms.

Keywords: Global navigation satellite system · Internet of Things (IoT) · ThingSpeak

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Track VIII

Implementation of Ionospheric monitoring system using Deep learning

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Abstract
The Internet of Things (IoT) and ionospheric deep learning are two emerging technologies that are transforming the way we interact with the world around us. IoT refers to the network of interconnected devices and sensors that can collect and exchange data, while ionospheric deep learning is a subfield of deep learning that focuses on using neural networks to study the Earth's ionosphere. When combined, these two technologies can have significant implications for a range of fields, including weather forecasting, agriculture, and telecommunications. By using IoT devices to collect data on weather patterns, soil moisture levels, and other environmental factors, scientists can feed this data into neural networks trained in ionospheric deep learning to create more accurate models of the ionosphere. These models can then be used to improve our understanding of how the ionosphere affects communication signals, weather patterns, and other environmental factors. In turn, this can help us to develop more effective technologies and strategies for mitigating the impact of ionospheric disturbances on telecommunications systems, satellite navigation, and other critical infrastructure. Overall, the combination of IoT and ionospheric deep learning has the potential to revolutionize the way we understand and interact with the environment, and could lead to significant advancements in a wide range of fields.

Keywords: Global navigation satellite system · Internet of Things (IoT) · ThingSpeak, Deep Learning

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Track VIII

Spectrum and Power allocation based on Dragonfly Algorithm for cognitive radio networks

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Abstract
The Dragonfly Algorithm is a nature-inspired optimization algorithm that mimics the swarming behavior of dragonflies. It has been successfully applied in various optimization problems. In recent years, it has gained attention in the field of cognitive radio networks (CRNs). CRNs are dynamic and complex networks that require intelligent resource allocation and spectrum management techniques to enhance network performance. The Dragonfly Algorithm is well-suited for these tasks due to its ability to handle dynamic and complex environments. The Dragonfly Algorithm for CRNs works by optimizing the spectrum allocation and power management of cognitive radio nodes. The algorithm is designed to maximize the utilization of available resources while minimizing interference and maintaining the quality of service (QoS) requirements of the network. The Dragonfly Algorithm achieves this by using a combination of exploration and exploitation strategies. The exploration strategy is used to discover new solutions, while the exploitation strategy is used to refine existing solutions. The Dragonfly Algorithm has several advantages in CRNs. It is robust, adaptive, and can handle dynamic environments. It also has a low computational complexity, which makes it suitable for resource-limited devices. In conclusion, the Dragonfly Algorithm is a promising optimization technique for cognitive radio networks. It can optimize spectrum allocation and power management in a dynamic and complex environment while maintaining the QoS requirements of the network. The algorithm has several advantages, including robustness, adaptivity, low computational complexity, and scalability, which make it suitable for CRNs.

Keywords: Cognitive radio networks, Spectrum allocation, Genetic algorithm, Dragonfly algorithm, Particle swarm optimization algorithm

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Track VIII

SECOND INTERNATIONAL CONFERENCE ON ELECTRICAL ELECTRONICS AND COMPUTER COMMUNICATION ENGINEERING 2023

Implementation of Regional Klobuchar Model forSingle-Frequency RNSS Users

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Abstract

In general, global positioning system (GPS) ranging errors and positioning caused by the ionosphere can be corrected by the Klobuchar ionospheric model. GPS satellites broadcast the model coefficients to the single-frequency users based on the average solar flux and seasonal variations. In low-latitude regions, such as India and Brazil, correction of the ionospheric delay based on these coefficients is not accurate because of the large gradients and complex dynamic ionospheric behavior. The traditional employment of refining the ionospheric Klobuchar model parameters with single-shell approximation is inappropriate for the equatorial/low-latitude regions. In this letter, we propose a technique to determine the ionospheric delay by using the new Klobuchar parameters (coefficients) based on multishell-spherical harmonics function (MS-SHF) analysis. It has been reported that by using the MS-SHF model, the ionospheric delays can be modeled accurately in the low-latitude regions. Furthermore, the proposed model performance has been evaluated with the Denis Bouvet (2017) single-frequency ionospheric correction model. In the single-frequency usage, the proposed model can improve (62.69%/77.08%) during quiet/disturbed days. Preliminary results reveal that the refined Klobuchar model parameters impart enhanced ionospheric delay corrections to regional navigation satellite systems with single-frequency GPS receivers, such as the Indian Regional Navigation Satellite System.

Keywords: Global positioning system (GPS), Klobuchar, low-latitude, multishell-spherical harmonics function (MS-SHF).

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Track VIII

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Comparisons of Various Global Ionospheric TEC Maps over Low Latitude regions

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Abstract

The global ionosphere total electron content (TEC) maps regularly archived by the international GNSS services (IGS) and its associate analysis centers (IAACs) serve as the important ionospheric products meant for single frequency receiver users, ionospheric analysis and model reliability validation. At present, there are eight IAACs producing global ionosphere maps (GIMs) following their own mathematical procedure which are then combined together to develop the IGS final GIMs. Several researchers in the past used the final or individual IAAC GIMs for validating their mathematical model formulations, regional/global ionosphere maps. However, it has been realized that the reliability of these maps differs with locations/regions depending on various facts like density of IGS GNSS stations, geomagnetic coordinates, seasons and solar activity. We tried to evaluate the performance of various GIMs at a near equatorial station in Bangalore, India (IISC; 13.02°N, 77.54°E) and a far equatorial station in Jomsom, Nepal (JMSM; 28.81°N, 85.74°E) low latitude stations by comparing with the observed TEC derived from global positioning system (GPS) receivers. The results show that EMRG GIMs are more reliable at Bangalore as opposed to the least performance of ESAG GIMs regardless of ionospheric conditions. Concerning Jomsom, the CASG and UPCG GIMs show fairly better performance among all the models whereas the least performance is realized in EMRG and CODG GIMs during the quiet and disturbed ionospheric conditions, respectively. The results give an insight to revisit the grid point accuracy of GIMs for positioning, further understanding of ionospheric variability, and a fair selection of GIMs as reference values while accessing regional ionosphere maps or model developments.

Keywords: Global Ionosphere Map; Total Electron Content; International GNSS Services; Indian latitudes

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Track VIII

Application of IoT in Hospital Management

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Abstract:
This paper provides effective explications for the problems faced in general wards of hospitals with help of IoT. In hospitals, general wards are always filled with patients and busy with hectic schedules. General wards always need to be rigorous and take utmost care about patient safety. Few issues that are noticed at hospitals are a timely change of saline bottle of patient, Power consumption, and air quality issues. The issues which threaten patient safety are low air quality, fire accidents and in some rare cases, vascular air embolism occurs. Since, hospital has got a hectic schedule, unnecessary power consumption increases. To increase patient safety, sensors are incorporated with the IoT to supervise the general wards continuously. This also helps hospital staff to save time and increases their work efficiency. Integrating sensors with IoT to watch environmental conditions can prove a boon to the hospital industry because it not only enhances the patient experience but also improves the staff flow decreasing the time- consuming activities.

Keywords: IoT, Vascular air embolism, Arduino, PIR, Ultrasonic sensor, MQ-135 sensor.

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Track VIII

Home Automation Using Telegram BOT

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Abstract:
IOT means devices or things connected over internet. With the rapid improvements in IOT heading in the direction of virtual generation wherein device to device interplay takes area with the assist of The Internet of things. The home equipment with inside the home, workplace and enterprise have become clever each day. This paper includes manipulation of home equipment the use of voice indoor, while in out of doors manipulate the use of App MQTT. In addition, the gadgets can engage and standing may be monitored and managed the use of a messaging carrier referred to as Telegram. Open supply hardware which include Raspberry Pi that is a palm PC to interface the home equipment with inside the home. To execute a home mechanization one should examine the inner parts of the equipment, which couldn't be conceivable by exclusive equipment. So this paper is an opportunity, and picked open equipment for the usage of an occurrence of uses of IOT. PI sheets are practical and simple to execute. Upon few programming guidelines, the Pi board would fill in according to the directions with the associated gadgets. This paper includes a PI board with an OS and an application called, “Telegram Bot” to send the IOT programming to detect and express the temperature and moistness of an area.

Keywords: App, appliances, Telegram Bot, Raspberry Pi, Home Automation.

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Track VIII

IoT Based Greenhouse Monitoring

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Abstract:
Greenhouses are managed space setting to grow plants. In order to understand the majority of plant growth, continuous monitoring and control of environmental parameters like temperature, humidity, soil moisture, light is crucial for the greenhouse system. Main theme of this project is to observe and measure the various parameters like temperature, humidity, light intensity and soil moisture of the crop/plants. To maintain constant/specific environment as requirement of a particular crop or plants. Temperature, Humidity, Light intensity and soil moist is measured with the help DHT11, LDR and Soil moisture sensor respectively. All environmental parameters are dispatched to android cell phone via online. Using cloud, we can observe and store the parameter details. All farmers can control their greenhouses from anyplace by understanding the status of their greenhouse parameters at any time and so they can control actuators (cooling fan, exhaust fan, water pump, artificial gentle and motor pump) to regulate environmental parameters. So, the person can monitor parameters by cloud.

Keywords: Greenhouse, Monitoring, Node MCU

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Track VIII

Development of Safety Monitoring for an IOT-enabled smart Environment.

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Abstract:
With the distended utilization of reconnaissance mission cameras. A library is proffered during this paper that is employed to try to to image preparing victimization programming tongues like python. This task uses Open CV Library to show the gap between the article and camera for the eudaimonia checking of the IOT climate. we've got adscititious 2 modules to the reconnaissance mission camera. 1st to understand the articles that area unit falling or unit victimization object space detector once the factor recognized then the client will get the caution message for that we tend to area unit victimization GSM module. Second there area unit various prospects to urge upgrade of observation camera thanks to deluge or water for the popularity of water we have a tendency to area unit utilizing precipitation board module and management module that includes of LM393 comparator on the off likelihood that the appliance known the precipitation, at that time it sends the message to the shopper. Results gain through screen catches of the examinations show the suitableness of the planned plot.

Keywords: Surveillance Camera, Smart home, Raspberry pi, Security.

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Track VIII

Low-Cost ECG based Heart Monitoring System with UBIDOTS Platform

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Abstract:
Electrocardiogram (ECG) equipment plays a vital role for the diagnosis of cardiac disease. How-ever the cost of this is huge and the operation is too much complex which cannot offer better services to a large population. So by using low-cost ECG with ESP32 module can check the Heart Monitoring. In this project using ESP32 module and AD8232 ECG sensor module without using Arduino board. By using ESP32 module can check the Heart Monitoring through online from anywhere or anyplace in this world. Ubidots platform is one of the best IoT platform to connect the things and visualize the data. Ubidots have wide number of knowledge visualizing options and it's an attention grabbing user-friendly interface. Signup by providing all the required details. After installing the required libraries in Arduino IDE, connect the ESP32 module to computer/laptop to upload the program. After successfully uploading in open serial monitor. On the Serial monitor, we'll see our ESP32 successfully connected to the programmed Wi-Fi and allocated with IP address. Then initiated MQTT connection with Ubidot cloud and connected to it. Then it started publishing ECG data along side a timestamp. Each data packet contains a variable label and 4 precise time-stamp data points. You can see the live Electrocardiogram on the Ubidots dashboard or platform. Ubidots will receive data from our ESP32 Module and plot the variable on the graph with provided Epoch Timestamp. Since we are sending data with Timestamp, there'll be no delay due to server latency on the graph. This helps to plot an exact electrocardiogram for Ubidots. So, Now anybody from anywhere within the world can monitor the actual person's heart by just logging into this Ubidots Platform.

Keywords: Electrocardiogram (ECG), low cost ECG signal generator circuit, peak detection of Ubidots

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Track VIII | 2023

Implementation of machine Learning in agriculture for optimisation of irrigation

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Abstract:

The agricultural industry contributes significantly to the economy. The primary issue and a hot topic worldwide is the automation of agriculture. The population is growing rapidly, and with with it, so are the need for food and work. Farmers tried traditional methods, but they weren't sufficient to meet these demands. New automated techniques were consequently introduced. These innovative techniques supplied the world's food needs while simultaneously giving billions of people access to jobs. A revolution in agriculture has been sparked by machine learning. This technique has helped to safeguard crop productivity from a number of circumstances, including population increase, job troubles, and food security concerns. The primary goal of this study is to evaluate the numerous ways artificial intelligence is being used in agriculture, including irrigation, weeding, and spraying with the use of sensors and other tools built into drones and robots. These technologies reduce the overuse of water, pesticides, and herbicides, preserve soil fertility, assist in the effective use of labour, increase output, and enhance product quality. In order to provide a brief overview of how automation is now being used in agriculture, including weeding systems using robots and drones, this study analyses the work of numerous researchers. Two automated weeding approaches are covered together with the various soil water sensing techniques.

Keywords: agriculture, artificial intelligence ,automation, Machine Learning, detection, weeding, drones

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Track VIII

A deep learning segmentation approach to predicting the weight of food images

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Abstract:
Today's youth is very conscious of what they eat and how many calories are in it. Eating too many calories can lead to weight gain, which has become a major health concern. Deep learning and artificial intelligence in general can be used to help understand the content of eaten food. In this master's thesis, we present a network for estimating food weight from a single image. This is accomplished in three stages: (1) image classification to determine what type of food it is, (2) segmentation to separate the different foods from the image, and (3) weight estimation. The calories are then calculated by comparing this to a food database. An inception network is employed for classification and weight estimates, while a YOLO network is used for segmentation. The solution is the first working example of estimating grammes from a single image. The weight estimation findings show a standard error of 8.95 for all categories and 2.40 for bread, the best category.

Keywords: Calorie estimation, Deep learning, Food classication,Image classication, Inception networks, Segmentation

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Track VIII

Automatic COVID-19 Fake News Detection System Using Deep Learning Techniques.

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Abstract:
Nowadays, the majority of people are publishing messages, images, and videos on social media against the covid-19 pandemic. Some of the posts are causing widespread concern among the populace. When a significant global public health emergency like COVID-19 breaks out, the public is exposed to an increasing number of fake news on social media networks. Automatically detecting the veracity of a news article guarantees that people receive accurate information, which is advantageous for the prevention and control of epidemics. However, the majority of existing methods for detecting fake news concentrate on inferring clues from text-only content, ignoring semantic correlations across multimodality. In this paper, we propose a novel method for detecting fake news by exhaustively mining the semantic correlations between text content and images (FND-SCTI). We first learn image representations using a pretrained VGG model and then use them to improve the learning of text representations using a hierarchical attention mechanism. Second, a multimodal variational autoencoder is used to learn a fusion of textual and visual content representations. Thirdly, the image-enhanced text representation and multimodal fusion eigenvector are combined in order to train the false news detector. Experimental results on two real-world datasets of false news, Twitter and Weibo, demonstrate that our model outperforms seven competitive approaches and can capture semantic correlations among multimodal contents.

Keywords: epidemic diseases, fake news detection, semantic correlation, multimodal fusion,social networks

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Real-time Detection of Anomalies in Container Virtualization Platform Performance Data

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Abstract:

Application virtualization platforms are virtualization technologies that enable independent operation of applications. It has been observed that applications operating on application virtualization platforms may occasionally experience abnormal working conditions. However, system administrators can detect such situations by carefully scrutinising the application log files. This allows for the capture of anomalous operating conditions long after their occurrence. This research proposes a method for detecting anomalous running conditions of applications operating on application virtualization platforms in real time. The proposed method combines algorithms for unsupervised learning and supervised learning. To demonstrate the usefulness of the proposed method, a prototype application was created. In order to demonstrate the efficacy of the method, real-time detection of aberrant operating conditions was performed with high precision using the prototype.

Making use of data pertaining to system resources in order to construct a modelWithin the confines of this study, a software architecture has been conceived of and put into action. This architecture is capable of identifying abnormal conditions by studying the previous work of a programme while it is running in an environment that supports application virtualization.During the first stage of the process, data from the programme working information that was obtained by an uncontrolled TBA-based abnormal condition detection approach will be parsed in order to determine whether it was abnormal or normal. After the model has been developed through the use of logistic regression, a controlled approach that is fed by these labelled data, the goal is to promptly label the abnormal condition, coming as close to the instantaneous level as possible, as the individual instantaneous programme work measurements are received.

Keywords: Detection of Abnormal Working Conditions, Principal Component Analysis, Logistic Regression, Application Virtualization Platforms, Container-based Virtualization, Real- time Abnormal Detection, Preventive Maintenance

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Track VIII

A review on Future perspectives of Blockchain in Healthcare

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Abstract
Due to vendor-locked health care systems, a lack of trust among data holders, and security/privacy issues around data exchange, health care today is known to suffer from segregated and fragmented data, delayed clinical communications, and divergent workflow tools. The sector of health information is prepared for rapid expansion and development. The work tries to reveal the untapped possibilities of the vast amount of health-related data and technologies. Through the successful implementation of deep learning frameworks, we strive to integrate a variety of persuasive viewpoints, principles, and frameworks to offer customised health care service options throughout this work. As the healthcare industry gains knowledge through connections between data over time, development will be gradual. The main issue facing the health care industry is how to accurately and effectively learn from unstructured clinical data using precise algorithms. In the healthcare industry, where patients' lives are on the line, inaccurate input data that results in inaccurate outputs and false positives is intolerable. The goal of this work is to explore the risks and opportunities associated with implementing deep learning algorithms to deliver personalised health care services. The application of deep learning in any field of health care, such as clinical trials, telemedicine, health records administration, etc., will be the specific focus of this work.

Keywords: Blockchain, Healthcare, Patient care, Cybersecurity, Patient privacy

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Track VIII

Rice Crop Disease Detection using YOLOv3

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Abstract:
Rice is a pivotal food for the 50% of the population on earth. The population on earth keeps on increasing day by day which increases the need for more food. In order to sustain the needs of the people we cannot afford to lose the crops to any kind of damage. Rice crops are being affected by diseases annually much more than one can think. In order to increase food production and the farmers' well-being, diseases can be detected by using today's technology. Detection systems are very handy when it comes to identifying the objects, images, videos. In order to identify the diseases in the crop in real time we are using the YOLOv3 algorithm which has proven its real time object detection in various applications. The accuracy of our system is 83.2% and the detailed analysis has been discussed in the Experimental Analysis section.

Keywords: Rice crop diseases, Bacterial Blight, Leaf Smut, Tungro, VoTT, Detection Systems, Amazon Rekognition, YOLOv3.

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Track VIII

FUTURE PRECISION AGRICULTURE USING ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

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Abstract:
Since the beginning, agriculture has served as India's economic foundation. The agricultural revolution in terms of crop cultivation, farming, and animal breeding has also begun to take shape due to the constantly shifting weather and climatic conditions. Precision agriculture has been implemented as a result of information and cognitive technology. This study discusses prospective approaches to precision agriculture that have been demonstrated to be effective in other nations using machine learning and artificial intelligence. With a focus on medium and large scale commercial farmers, the broad range of utilisation for the present and future, along with accompanying issues, have been examined**.** These cognitive technologies have already been implemented by advanced nations, leading to higher GDP growth, lower mortality rates, and higher living standards. This industry has historically experienced moderate growth, but starting in 2016, a large number of start-ups have emerged that are producing significant returns on investment.

Keywords: promising solutions, artificial intelligence, precision agriculture

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Track VIII

AUTO-FLOW IRRIGATION SYSTEM BASED ON IOT APPROACH

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Abstract:
This study describes an automated irrigation system based on Internet of Things (IoT) technology that intends to increase irrigation in agriculture's efficacy and efficiency. A microcontroller, a cloud-based server, and a network of soil moisture sensors make up the system. The microcontroller receives the measurements of the soil's moisture content from the sensors. If the soil moisture falls below a predetermined level, the microcontroller analyses the data and turns on the irrigation system. The server gathers and stores the sensor and microcontroller data and offers a user interface for remote monitoring and management of the irrigation system. The suggested system has a number of benefits, including less water use, higher crop yields, and better resource management. It is also adaptable and simple to modify to fit the unique requirements of various crops and environments. Overall, by enhancing efficiency and sustainability, the IoT-based automated irrigation system has the potential to alter the way agriculture is carried out.

Keywords: Internet of Things (IoT), microcontroller, automated irrigation

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Track VIII

An analysis of Advancement in Various Image Processing Techniques

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Abstract:
Image processing is a technique of achieving worthy actions on a picture, for improving the image. Image processing is forever an attractive field as it provides enhanced illustrative data for human understanding and image processing statistics for storage, communication, and illustration for the discernment of machine. The image processing system improves the raw pictures taken in regular day to day life for different purposes. In recent days, image processing is improved and expanded to different domains of science and technology. It mostly pledges with image enhancement, image acquisition, image segmentation, image classification, feature extraction, and so on. Image processing is a type of signal processing, where input is a picture and the outcome might be a picture, attributes of that picture. It will be considered as two-dimensional signs and methods of sign preparation will be considered to that two-dimensional picture. It is one of the rising advances and in numerous ongoing applications picture handling is generally utilized. In the field of bio innovation, software engineering, in the clinical field, ecological zones, and so on. Picture handling is being utilized for humankind's compensation. Image processing faced a lot of challenges like unequal resolution, unequal illuminations, format variations, noise, and distortions. Many methods have already been proposed up to today for improving the digital images. In this paper, we define the different approaches used in various stages of image processing.

Keywords: Image processing, Analog & Digital image processing, Image segmentation, Image enhancement.

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Track VIII

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A Cloud -based Invasion Detection System that uses Secure Hashing Methods

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Abstract:
All industries have the same fundamental problem of insufficient defense, but today's adversaries are making significant efforts to penetrate these defences in order to engage in illegal insider trading. They identify a wide variety of information theft conduits. Private details is more vulnerable to intrusion in the modern world. While there are numerous defences against various forms of assault, hackers are always developing novel methods of breaching existing defences. As a result, in this article, an attempt to create a novel approach that would be very resistant to such an assault have been done. The suggested scheme includes the implementation of a hash map-based system for detecting intrusions. In this system, the item is hashed and then stored as a shared key. The safe transfer of data is a key issue nowadays. Users in the data-sharing system may encrypt their files using their own personal keys before uploading them. In this work, a secure and efficient implementation of the technique, as well as a proof of its security is provided. Many obstacles stand in the way of data owners when they want to make their data available through server or cloud storage. The issues may be addressed in a variety of ways. For the safe management of a shared key belonging to the data's owner, several methods are required. In this article, the concept of a trusted authority as a means of verifying the identities of cloud data users have been discussed. The trusted authority will utilize the SHA algorithm to produce the key, and then distribute it to the user and the owner. To determine the hash value, the certified authority system utilizes the MD-5 method after receiving an AES-encrypted file from the data owner.

Keywords: Object, Hashing, Hash Map, Intrusion Detection System, Intrusion, Security.

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Track VIII

Rice Field Classification from SAR Images using Deep Learning Algorithm

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Abstract:

Agriculture is one of the most important national economic industry. Ensuring food security and stabilizing the food supply are the government's primary goals. Synthetic aperture radar (SAR) images will not be affected by climatic factors, which are an effective tool for the forecast of rice production. This research uses the deep learning algorithms to identify rice fields from SAR images. The results show that deep learning algorithms can greatly reduce the proportion of model false positives to 55.26%, produced higher average precision of 93.50%, and F1-score of 0.9568. The deep learning algorithms have produced good results for rice field identification compared with state-of-the-art neural networks.

Keywords: Synthetic Aaperture Radar, Deep Learning, Rice Fields, SAR Images

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Rice Field Classification from High-Resolution Images using YOLO v4

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Abstract:
In recent years, Deep Learning (DL) methods have gained popularity to extract and analyze specific information from images. This study aims to apply DL methods in the field of agriculture. In this research, you only look once version 4 (YOLO v4) has been implemented for rice field detection from high-resolution images taken by an unmanned aerial vehicle (UAV). YOLO v4 consists of an extra layer that can extract special feature maps for the detector. The experimental results show that the YOLOv 4 has provided the best performance in terms of an average precision at 84.68% compared with other models.

Keywords: Unmanned Aerial Vehicle (UAV), Deep Learning, Detectors, High-resolution Images

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Track VIII

Real-time Pedestrian Detection using Lightweight YOLO v3

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Abstract:
In recent years, autonomous driving vehicles have gained popularity. With this automated driving technology, Pedestrian detection is a challenging task. This work proposed a lightweight YOLO v3 network to improve its pedestrian detection efficiency on Nvidia Jetson TX1. The experimental results showed that the proposed framework can accelerate the frame rate per second (FPS) from 18 FPS to 32 FPS with comparable mean average precision (mAP).

Keywords: Autonomous Vehicles, YOLO v3, GPU

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Track VIII

Natural Face Deocclusion using Generative Adversrial Network

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Abstract:
Trend of wearing masks in public is growing in recent years all over the world due to COVID-19 epidemic. In the public security checks like railway stations, and airports, face recognition systems can not effectively recognize the masked faces. This work aims to detect the face mask and then generate the unmasked facial images. The contribution of this research is divided into two stages: mask object detection and image completion of the removed mask region. The first stage of our model is to automatically detect the mask on the face using the pre-trained model of MobileNet-v2. Then, the second stage removes the mask and synthesizes the affected region with fine details of original face structure using Conditional Generative Adversarial Network (cGAN). The results in this project suggest that MobileNetv2 and cGAN can be a promising approach for masked face recognition.

Keywords: Face Deocclusion, Generative Adversarial Network, Masked Face Images

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Track VIII

Building Deep Learning model for classification of Breast Cancer using Image Segmentation

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Abstract:
Deep learning-based techniques have been successfully applied to the analysis of mammograms. In the last years, a high number of breast medical examinations have been collected, which allowed for the development of several medical imaging techniques, such as tumor localization and segmentation. In our proposed method, Yolo v4 model was used as breast Tumor tumor localization and Connected-Segnets as the Deep Learning model for subsequent accurate segmentation. This proposed method was evaluated on two publicly available datasets, CBIS-DDSM and INbreast, and a private dataset obtained from CHENG HSIN GENERAL HOSPITAL. Taiwan. Using pre-processing methods to improve Mean Average Precision (mAP), and finally the use of our proposed deep learning architecture: the enhanced version of YOLOv4. It is the improvement of YOLOv4's feature extraction part of the architecture. This architecture changes the number of feature maps of different sizes called Resblock to be specialized for larger and smaller tumors, making it more
suitable for feature extraction of breast tumors and further increasing mAP. After the ROI was obtained, the connected-Segnets method was proposed by improving the model of object segmentation. Compared to three state-of-the-art fully convolutional networks, our proposed architecture Connect Segnet achieved the best performances with an average Dice similarity coefficient of 94.72 on the INbreast dataset, 92.36 on the CBIS-DDSM dataset, and 90.57 on the dataset provided by CHENG MISIN GENERAL HOSPITAL. This robust assessment of the system model paves the way for clinical trials to improve the accuracy and efficiency of breast cancer screening.

Keywords: Deep Learing, Breast Tumor, Yolo v4, Connected-Segnets

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Track VIII

Building Trust in Cloud-based Internet of Things (IoT) Ecosystems: A Trust Framework Approach

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Abstract:
Cloud-based Internet of Things (IoT) ecosystems have witnessed significant growth, enabling seamless connectivity, data sharing, and advanced services. However, concerns regarding trust and security hinder their widespread adoption. This paper proposes a trust framework approach to address the trust challenges in Cloud-based IoT ecosystems. The trust framework encompasses various dimensions, including reliability, privacy, security, and availability, to evaluate the trustworthiness of entities within the ecosystem. Quantitative and qualitative trust metrics measure the trust levels of IoT devices, Cloud service providers, and users. Trust assessment relies on historical data, reputation analysis, and behavior monitoring. To foster trust, the framework incorporates trust management mechanisms such as negotiation, delegation, and recommendation. Advanced security measures, including encryption, access control, and anomaly detection, are integrated to mitigate security risks and safeguard IoT data integrity and confidentiality. Through simulations and case studies, the proposed trust framework demonstrates its effectiveness in enhancing trust and enabling secure communication within Cloud-based IoT ecosystems. The framework enables accurate trust evaluation, reliable interactions, and secure data sharing. This research contributes to the field by providing a comprehensive trust framework that addresses critical trust challenges and promotes trust among entities, facilitating the widespread adoption of Cloud-based IoT ecosystems in diverse domains. It lays the foundation for secure and trustworthy interactions in the evolving landscape of Cloud-based IoT ecosystems.

Keywords: Cloud, IoT, Trust, Privacy, Reliability, Availability

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