ASCIS 2022

Marwadi
University
Marwadi Chandarana Group

1st International Conference on
ADVANCEMENTS IN SMART COMPUTING & INFORMATION SECURITY

CONFERENCE PROCEEDINGS

Compiled by :

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ASCIS 2022

Marwadi University, Rajkot

1st International Conference on

Advancements in Smart Computing & Information Security

Conference Proceedings

Marwadi University
Marwadi Chandarana Group

Message From Provost

Dr. (Prof) Sandeep Sancheti
(Provost - Marwadi University)

The world is digitally evolving and as an emerging University it is our duty to lead changes and endorse innovation as per the evolving needs. Marwadi University, the pioneer of research-based advanced learning in the Gujarat region, once again is laying the ground for advanced research especially in areas like Smart Computing and Information Security through ASCIS Conference. This conference is promoting the knowledge-seekers in the domains of AI & Machine Learning, Cyber Security, Smart Computing and Industry 4.0 and also highlighting the strong need for research in these areas. Such research contributions would greatly impact the future and lead to the impactful technological advancements.

The confluence of the speakers, industry personnel, academicians, researchers and research enthusiasts brings together a pool of ideas and problems that need to be resolved through this conference. I appreciate the Keynote Speakers, Experts and Authors whose papers have been selected and program committee members who have collectively added great value to this conference.

I wish this conference huge success in all its endeavours!

Message From Dean Research

Dr. R.B. Jadeja
(Dean Research, Marwadi University)

As rightly said by Albert Einstein that "You never fail until you stop trying" same is the research an undulating zeal of the researchers that had given a new paradigm to our scientific journey.

The diversity and inclusiveness within the research have been the heart of our learning environment. The goal of the university is just not only to increase the quantity of research but, more importantly, to ensure impact through high-quality research.

Marwadi University augments its global impact in the field of research through international collaboration with various foreign universities such as **Advancements in Smart Computing and Information Security 2022** which is a step towards increasing research activities as well as a platform for all of you to learn and explore in the field of research.

The quest for knowledge by our research team is exemplary and Marwadi University always encourages its scientific endeavour. It has been a proud privilege to share that within a year Marwadi University has excelled in the field of research publications, project grants, major research completion, and various publications peer-reviewed book chapters and books, the achievements that were garnered amidst the challenges.

As said by Zig Ziglar "You don't have to be great to start, but you have to start to be great. Being a researcher requires dedication, hard work, and more than a little inspiration, hereby I urge each one of you to contribute in the areas of research.

Message From Convener

Dr. R. Sridaran
(Dean Computer Applications, Marwadi University)

"Technology is the best when it brings people together"

I firmly believe that our 1st International Conference ASCIS has been embedded with all the essential elements of a successful conference in terms of adequate number of quality papers, most valuable key note sessions, Springer CCIS collaboration, Sponsors including GUJCOST DST and so on. Thanking all the contributors for the success of ASCIS. The abstracts of all the selected papers under the four major tracks namely AI, Cyber Security, Smart Computing and Industry 4.0 are included in this proceeding. You may also visit the official web site of the conference for downloading the same. We will surely make use of the learnings earned this time for the betterment of ASCIS 2023.

Keynote Abstracts

Post-pandemic Applications of AI and Machine Learning

Dr. Priti Srinivas Sajja
Professor, Sardar Patel University, India

The history of mankind has witnessed many pandemics since its inception. Fortunately, the collective knowledge of mankind has helped us a lot to fight the pandemic and better immune and well-evolved society. The recent pandemic of SARS-Covid-19 pandemic has taught us many things too. Fields such as healthcare, education, production, sales and marketing, and education have suffered a lot during the lockdown and pandemic period. The needs such as working in an independent & isolated way, increased automation in many businesses,quick and secure solutions, and effective control and monitoring became inevitable.

The ubiquitous nature of Artificial Intelligence and Machine Learning (AIML) offers a way to meet the above-mentioned need. Healthcare is the first domain where AIML can help. Starting from tracking patients, finding medical resources such as hospital beds, oxygen, and other drugs, diagnosing diseases to inventing novel drugs& vaccines for the disease, AIML can help. The scarce resources are difficult to manage quickly and efficiently without the techniques such as genetic algorithms, neural networks, and other machine learning methods such as generative networks, decision trees and clustering; to name a few. AIML can also be used in managing big data from health informatics.

Another important domain is training and education. Using many online platforms, education can be continued in a non-traditional manner. However, it cannot distinguish and handle different levels of students and hence customization is needed. Similar challenges arise in monitoring people in work-from-home scenarios. Domains such as production, sales & marketing, planning & designing, military and defense, eCommerce, egovernance, etc. also required the support of AIML techniques to increase degree automation, security, and intelligence. While lockdown, entertainment, web surfing, awareness, and morale-boosting types of applications are also highly needed which are intelligent, learn from data, and offer a significant amount of customization.

The problems and needs within the aforementioned domains are discussed here with the challenges & requirements. The possible solutions through the AIML techniques are discussed with brief solution outlines. Possible research applications in each domain are also enlisted using techniques such as deep learning, generative neural networks, hybrid neuro-fuzzy systems, etc. It is to be noted that, in absence of generalized logic AIML based system can learn from data to provide quick as well as better quality solutions.

Smart and Soft Computing Methods for Prioritizing Software Requirements in Large-Scale Software Projects

Vassilis C. Gerogiannis
Professor, University of Thessaly, Greece

Large-scale software projects often have numerous candidate functional requirements/software features needed to be prioritized, under multiple prioritization criteria by various stakeholders, who need to decide which requirements/features will be implemented in the next software releases. Most existing requirements prioritization approaches perform well on small sets of candidate requirements, but suffer from scalability for large number of requirements. Furthermore, all involved stakeholders may do not have enough knowledge to accurately and objectively prioritize all candidate requirements. Particularly in distributed software projects, stakeholders can be geographically dispersed and they often do not have the ability to negotiate and reach a consensus on the final list of requirements' priorities. To support these challenges, we propose the use from smart and soft computing methods (e.g., Intuitionistic Fuzzy Sets, Clustering Analysis and Recommender Systems) to handle stakeholders' uncertainty, minimize stakeholders' information overload, as well as to identify patterns that summarize the stakeholders' preferences on the candidate software features. The suggested methods have been applied to requirements datasets of existing large-scale software projects and to illustrative artificial datasets as well. The results are promising since they indicate that the suggested methods can effectively support multiple stakeholders in order to prioritize sufficiently a large number of requirements, under multiple criteria, while combining scalability and flexibility.

Your Readiness for Industry 4.0

Nitin Bawsay
VP Operations, India at Cin7 Americas

As the world witnesses development, from the wheels to steam engines, to electricity and mass production to digitization - we are NOW at the cusp of adopting the 4th leap into industrialization. We will now witness more and more of the Artificial Intelligence (AI), Robotics, Internet of Things (IoT), Mixed Reality (MR) and much more of volume-based technology aspects in our day-to-day life. The overall industry impact of this will be the single, most obvious thing - Development.

As the world gets ready to embrace this new tech termed Industry 4.0 (or X.0?), it is important that everyone of us gets ready to adapt and adopt to the new. Multiple areas that mark the Industry 4.0 are fascinating and do include:
- Automations
- Cost-saving
- Lower labor
- Unlearning and Relearning
- Capital sensitivity

All this holds value today and will continue to do so. However, adoption to the new tools and technics will be the key to this and this Change will be inevitable. The key to Your Readiness to this Change will make the difference.

We will dig into some instances of change in the Industry 4.0 with the right kind of tools and technology for today and tomorrow.

Securing NexGen Automotives - Threats and Trends

Dr.Ramkumar G.

Cyber Security & Risk Leader, Nissan Digital, Nissan Motor Corporation, India

In today's connected world, it is no surprise that new age connected car technologies are targeted by Cyber criminals. There are many instances where hackers specifically target automotive sector – computer networks, applications, factories,
Cars exploiting technology and people vulnerabilities. This leads to hundreds of millions to billions of USD in litigation, brand damage, loss of business, and market share decline and damage reputation for automotive original equipment manufacturers (OEMs).

In order to ensure connected cards are safe for people from cyber-attacks, governments' world over are introducing more strict regulations and penalties on automotive OEMs. The business impact of a large cyber-security incident/ data Breach at an OEM is significant and could run into Billions of USD including through:

Regulatory penalties, mass recall on multiple vehicle lines, factory refit, decline in sales, etc and Reputation Risk. Given the prevailing scenario, it is imperative for automotive OEMs to have critical focus on our end-to-end cyber security program and have the right tools, processes and people to drive this effectively. The key note address covers the following aspects related to connected cars cyber security.

1. More Connected Cars = Higher Risks
2. Potential attacks on connected vehicles
3. Top Industry sectors targeted by Hacker groups
4. Key cyber security incidents in automotive sector
5. Affected Automotive Segments
6. Automotive Threats in the Deep & Dark Web
7. Standards & Regulations
8. What OEMs need to do?
9. What Suppliers need to do?
10. What CISOs need to do?

Cyber Attacks Classification and Attack Handling Methods using Machine Learning Methods

Dr.Padmavathi Ganapathi
Dean, Avinashilingam Institute for Home science and Higher Education for Women, Coimbatore, India

Cyber-attacks are predominantly increasing day by day due to the tremendous growth of latest technologies and innovations. There are different kinds of cyber-attacks are evolving in every day to day life. Some of the trending cyber-attacks between 2021 and 2022 include Ransomware attacks, Internet of Things (IoT) attacks, Cloud attacks, Phishing attacks, Malwares, cyber extortion and many more. The goal of the attacker or cyber criminals is to steal the user personal credentials without the knowledge of the user in an illegitimate way. Once, the user access control of the network devices are hacked by the criminals they take over the system control and monitor all the legitimate user activities. To detect the unavoidable illegal intrusions by the attackers through cyber-attacks in various forms are handled by vigilant intrusion detection system. Through, Intrusion Detection System (IDS) mechanism, it must be able to detect and protect the unlawful intrusions through various attacks handling methods. Some of the robust intrusion detection techniques such as signature based, anomaly based and protocol based methods. By incorporating appropriate intrusion detection and prevention system (IDPS) method in an organization will help to detect and mitigate the cyber-attacks effectively. An IDPS is a robust mechanism followed by the worldwide cyber security professionals and network administrators to safeguard the network connected devices. However, IDPS mechanism provides a stout framework to handle cyber intrusions. Similarly, Artificial Intelligence (AI) based attack detection methods using the machine learning (ML) and deep learning (DL) algorithms provides a user friendly automation model to detect the attacks evidently without any human interface.

The Internet of Things (IoT) Ecosystem Revolution in the World of Global Sports

Prof Dato' Dr Shamala Subramaniam
Universiti Putra Malaysia

Industrial Revolution 4.0 (IR 4.0) has changed the demographics of multiple significant areas such as robotics, simulation, travel, healthcare, and sports. The emergence and extensive development and deployment of IR 4.0 completely altered the methodologies of sports performance monitoring distinctly. IR 4.0 has seen the birth of multiple new computing Paradigms, and tools computer scientists use in the sports sector. This keynote will address the eco-systems in sports and the leverage the Internet of Things (IoT) has in this exponentially growing domain. A detailed discussion on focused on methodologies of sports performance analysis, sport-specific analysis and other technology revolving around sports performance analysis will be done. The talk encompasses detailed analyses on the correlation between the athlete, the sports aspect of their life, the non-sport aspect and the methodologies of sports performance analysis. The development and deployment of an off-field sports performance analysis system developed will be used as a core element in the address the harnessing of IoT in sports. The further integration and enhancements with a comprehensive eco-system encompassing a developed Games Management System will conclude the talk with the discussions on a wide spectrum of open issues.

Orchestration of containers: Role of Artificial Intelligence

Dr. Ramkumar Lakshminarayanan,
Assistant Dean for Academic and Scientific Research,
University of Technology and Applied Sciences-Sur, Sultanate of Oman.

The container is a novel technology that revolutionizes the development of cloud computing in creating and controlling the platforms by bundling the codes of applications with libraries and configuration files. Containers are easily deployable, isolated, have data sharing and are portable.The challenges to be addressed in the orchestration of containerized cloud computing are application portability, performance, and the new architecture development. Machine Learning and Deep Learning-the subset of AI makes it possible to solve the problems in selecting, deploying, monitoring, and dynamically controlling the containerized application. This research presents the difficulties of autonomous container orchestration, along with modern AI solutions and unresolved issues.

Enterprise Cybersecurity Strategies in the Cloud

Andrew Hodges,
Senior Security Advisor, Asia Pacific and Japan,
Amazon Web Services (AWS)

This session shared numerous insights about the threats that public and private sector organizations face and the cybersecurity strategies that can mitigate them.

During this session the various cybersecurity strategies are examined that have ultimately failed over the past 20 years, along with a few that have actually worked. It gave a very good insight to executives and security and compliance professionals to understand how cloud computing is a game changer for them.

By the end of the session, some examples were shown for how to effectively measure the effectiveness of organizations cybersecurity strategy, the ingredients for a successful cybersecurity strategy, cybersecurity investment roadmaps and efficacy, and how you can help employ and protect your organizations and yourself.

Basics of Cyber Security

Mr. Azaz Faruki
Associate Partner, A.T. Kearney, Dallas, USA

Cyber security enables protection of assets from cyber threats to assure the confidentiality, integrity and availability of data related to an asset. Cyber security threats globally have evolved from small unsophisticated attacks to nation-wide attacks. The incidence of cyberattacks on organizations is accelerating, due to increasing vulnerabilities and lack of robust cyber security measures.

The negative effects of a data breach are not limited to costs but also have an adverse impact on customers, brand, and stock price. Highly regulated and critical industries bear higher costs in the event of a data breach. Companies in developed countries incur higher costs as compared to emerging markets. As the modern enterprise is increasingly connected, sensitive data is proliferating and increasingly vulnerable.

The complex universe of connected systems and networks creates additional challenges across large global organizations. Cyber Security investment plans have transitioned from the CIO/CTO agenda to a hot topic in the CEO agenda.Organizations require a cyber strategy that addresses business, technical and reputational risks.Cyber security strategy should be underpinned with global best-practice standards to ensure rigor and legitimacy.

It is critical to understand the organization's risk appetite and high value assets to determine the acceptable risk profile. Setting cybersecurity policies and standards are critical to ensure compliance across the organization. Clear definition of incident levels and associated response enables faster recovery in the event of an unforeseen attack. Looming global cyber risk and its catastrophic consequences makes cyber security a burning topic for all firms.

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Galaxy Classification Using Deep Learning

Premanand Ghadekar, Kunal Chanda, Sakshi Manmode,
Sanika Rawate, Shivam Chaudhary, Resham Suryawanshi

Abstract: In this paper, the framework of Deep CNN (Deep Convolutional Neural Network) is basically used for classifying the galaxies. It is shown that galaxies can basically be classified with the help of distinct features into the different categories namely Disturbed galaxies, merging galaxies, Round Smooth galaxies, In-between Round Smooth galaxies, Cigar Shaped Spiral galaxies, Barred Tight Spiral galaxies, Unbarred Loose Spiral galaxies, Edge-on galaxies without bulge and Edge-on galaxy with the bulge. The model that we are proposing is a ConvNet galaxy architecture consists of one input layer having 16 filters, followed by 4 hidden layers, 1 penultimate dense layer, along with an Output Softmax layer. we also included data augmentation such as shear, zoom, rotation, rescaling, and flip. we used the activation function. The dataset which is used in the proposed research is Galaxy 10 DECals, which has taken its images from DESI Legacy Imaging Surveys and got labeled by Galaxy Zoo. The dataset used contains 256×256 pixel-colored Galaxy images (g, r, and z band). The proposed model and framework is training over 17736 images and accomplished above 84.04% in testing accuracy. When a comparison is made between the results and the testing accuracy was compared with other existing models.

Word Sense Disambiguation for Hindi Language using Neural Network

Binod Kumar Mishra, Suresh Jain

Abstract: One of the major hurdles in the development of Natural language Processing applications is ambiguity and the process to solve is known as Word Sense Disambiguation. It is useful to determine the appropriate meaning of polysemy words in each context using computational methods. In every language, ambiguity exists, and to resolve this Knowledge, Supervised, and Unsupervised based approaches are used. Over the past ten years, the Indian government has launched a large number of digital services for its citizens. To better serve Indian citizens, these services are primarily based on Hindi or other Indian languages. For it to be easily accessed by web portals or any electronic device, natural language processing is required. Since English and other languages such as Chinese, Japanese, and Korean have abundant resources for natural language processing application development. Due to the limited resources available for disambiguating polysemous words in Hindi and other Indian languages, building applications based on these languages becomes challenging. This paper provides a very gentle introduction to the simplest version of neural network techniques for solving ambiguity problems who are not familiar with integration with IndoWordNet. The outcomes demonstrate that the suggested technique performs consistently and significantly better than the alternatives.

Social Media Addiction: Analysis on Impact of Self-Esteem and Recommending Methods to Reduce Addiction

Zarana Ramani, Dr. Hiteishi Diwanji

Abstract: In today's world, everything moves towards virtual from the real world especially business, meetings, shopping, and connections to people. As technology makes life easier, everyone is slowly moving towards it. A platform that allows people to connect with other people all over the world is known as social media. Social media has a wide variety of features that make people stay on that platform. The use of social media has many benefits but excessive use of social media can degrade mental health, and physical health and can affect daily-functional life. Also, human mental health is closely connected to self-esteem. In this research, we have identified the impact of social media addiction on self-esteem and the impact of different variables such as notification response, age, gender, etc. on self-esteem and social media addiction. After analyzing the impact, we have suggested methods to reduce social media addiction based on all groups of people and based on similar social media addiction level groups of people using a collaborative filtering algorithm. As a result, we have found that there is a significant difference in self-esteem based on notification response, and a significant difference in social media addiction based on social media daily usage but there is no significant difference in social media addiction and self-esteem based on gender. Recommending methods to reduce social media addiction based on a similar group of people perform a bit better than all groups of people.

Comparative Analysis of Different Optimized Structural Feature Extraction Algorithm for Estimation of Parameters in Image Registration

Satarupa Biswas, Joydev Hazra, Aditi Roy Chowdhury,
Kousik Dasgupta, Paramartha Dutta

Abstract : Proficient image registration is evaluated by optimizing the differences between two or more images taken from distinct modality, in terms of time and viewpoints. In this paper, we investigated the registration efficiency by extracting features using various feature extraction methods and selecting the optimum features set to estimate the various transformation parameters. HOG (Histogram of Oriented Gradients), KLT (Kanade Lucas Tomasi), and SIFT (Scale Invariant Feature Transform) feature extraction techniques are applied. To choose the discriminated features extracted by SIFT, the optimization algorithms PSO (Particle Swarm Optimization), EO (Equilibrium Optimization), and AOA (Arithmetic Optimization Algorithm) are used. The transformation parameters are estimated using a back propagation neural network based prediction model. The experiment is run on multiple of medical images, conventional benchmark images, and SAR (Synthetic Aperture Radar) images, and the accuracy of parameter estimation is reported in average MSE.

A Combined Method for Document Image Enhancement using Image Smoothing, Gray-Level Reduction and Thresholding

Prashant Paikrao, Dharmpal Doye, Milind Bhalerao, Madhav Vaidya

Abstract: Document digitization is becoming popular with its enhanced portability, efficient storage, processability and easy retrieval. Document images acquired using the scanning process are filled with additional noise. These noises in document images are associated with document paper quality, the typing machine or printer, or the scanner during the scanning process. Aging, folded corners, stains, shadow-through, and bleed-through noises are also present in this process. During digitization, these noises may get amplified and make the digital representation further noisy. Noise removal methods, techniques, or algorithms refer to the process of removing noises from digital images utilizing image processing, image analysis, or filtering approaches. The transmission, scanning, and aging processes individually or in combination could lead to introducing noise in images. So, here speckle noise is considered for modeling the noise during transmission, Gaussian noise during scanning procedures considering the thermal radiations of the scanning mechanism, and the salt and pepper noise (impulse valued noise) for representing the aging phenomenon. To eliminate a certain kind of noise, a particular noise removal technique uses a special kind of filter. Based on the aforementioned noises, a combined method for noise reduction from scanned document images is proposed. The result of the proposed method is presented considering the resultant image quality. The metrics like Mean Square Error, Signal-to-Noise Ratio, Peak Signal to Noise Ratio, and Structural Similarity Index Metrics are used to evaluate the quality of resultant image.

A Comparative Assessment of Deep Learning Approaches for Opinion Mining

Nidhi N. Solanki, Dipti B. Shah

Abstract: Opinion mining is a branch of artificial intelligence being used in a variety of applications that transforms human emotions into digital form and tries to better understand the customers. Good customer relationship is a key formula for business intelligence. Deep learning is a subset of machine learning and is comparatively more powerful. Opinion mining techniques illustrated in the last few years have shown that noble performance can be achieved by the use of neural networks. Automation performs good time utilization with the help of illustrated online and offline tools. This study emphasizes the reviews of research in opinion analysis using deep learning models with their advantages and disadvantage. It also investigated different neural networks, their architecture, dataset, and other techniques.

Performance Enhancement in WSN through Fuzzy C-Means based Hybrid Clustering (FCMHC)

Roma Saxena, Akhtar Husain

Abstract: The researches in Wireless Sensor Networks (WSNs) strive for the efficient data transmission with optimized lifetime of the system. Load Balanced Clustering contributes energy efficiency by ensuring the even load distribution restricting thereby the premature energy drain at the level of nodes. The authors of this research study propose a Fuzzy C-Means based Hybrid Clustering (FCMHC) approach that forms the clusters using Fuzzy C-Means algorithm and thereafter applies Fuzzy Logic for selection of Cluster Head (CH). A critical comparison of the proposed approach with the representative protocols in the domain of WSNs viz. LEACH and CHEF was accomplished on the basis of performance. The results reveal that FCMHC outperforms LEACH and CHEF on the parameters viz. network throughput, energy utilization and network stability caused by improving the active nodes in the system.

A Review of Gait Analysis based on Age and Gender Prediction

Charmy Vora, Vijay Katkar

Abstract: The tools for creating and analyzing gaits are improving all the time. Demand for a gait-based dataset that can be recognized and used to extract useful information is at an all-time high. Gait analysis has been around for a while, however, inertial sensor-based gait datasets are a relatively recent development. As a result, the majority of studies employing machine learning algorithms on the gait dataset rely on visual representations. Among the several analyses that may be performed on a person's gait to determine their identity, determining their gender and age proves particularly difficult. Recent studies on gait-based age and gender detection are summarized and compared in this study. This also reveals where researchers want to go in the future and what obstacles they'll have to overcome.

Handwritten Signature Verification using Convolution Neural Network (CNN)

Dhruvi Gosai, Shraddha Vyas, Sanjay Patel,
Prasann Barot, Krishna Suthar

Abstract: Despite recent widespread research in the field, handwritten signature verification is still an unresolved research problem. A person's signature is an important biometric trait of a human that can be used to verify a person's identification. There are two primary biometric identification methods: (i) A method of identification based on vision and (ii) An identification method without the use of vision. Examples of vision-based identification include face reading, fingerprint identification, and retina scanning. The other examples for non-vision-based identification include speech recognition and signature verification. In financial, commercial, and legal activities, signatures are crucial. Two methods are widely studied and investigated for signature verification: the online method (dynamic method) and the offline method (Static approach). Offline systems are more practical and user-friendly than online systems, but because they lack dynamic information, offline verification is regarded to be more difficult. Systems for verifying signatures are designed to determine if a particular signature is authentic (made by the claimed individual) or a forgery (produced by an impostor). The data collection, feature extraction, feature selection, and classification model make up the bulk of the suggested model. A convolutional neural network is used to extract features, and machine learning algorithms are used to verify handwritten signatures. To train CNN models for feature extraction and data augmentation, raw images of signatures are employed. VGG16, Inception-v3, ResNet50, and Xception CNN architectures are employed. The recovered attributes are classified as authentic or false using Euclidean distance, cosine similarity, and supervised learning techniques such as Logistic Regression, Random Forest, SVM, and its variants. Data from ICDAR 2011, including pairwise-organized Signature Datasets, was used for testing. The database comprises the signatures of 69 different people.

Comparative Analysis of Energy Consumption in Text Processing Models

Krishna Sriharsha Gundu, Lakshmi Padmaja Dhyaram,
G N V Ramana Rao, Surya Deepak G

Abstract: In this paper, we examine different ways to analyze text from live feed. This analysis is mandatory for large organizations such as YouTube and Facebook to keep their platform user-friendly. The challenge in performing natural language processing to a live feed is the energy required to train a model which can perform the task. we have attempted to address the problem of performing sentiment analysis by taking an example, of live comments in Law and Crime Network's live feed of Amber Heard vs Johnny Depp that has taken place recently. The results from the experimentation are used to show the energy consumption patterns of different text processing models and choose the most efficient one.

Evolution towards 6G Wireless Networks: A Resource Allocation Perspective with Deep Learning Approach -A Review

Pradnya Kamble, Alam N. Shaikh

Abstract: Currently, the number of mobile devices is growing exponentially. To cope with the demand, a highly efficient network is required. This rising need for high-speed mobile data rates of up to 1 Tbps might well be satisfied by the sixth generation of mobile networks. It is anticipated that the 6G network would feature a sub-terahertz band and be able to achieve speeds of at least 100 Gbps. A significant amount of resources are required due to the rapid expansion of IoT and other applications. 6G wireless networks can give worldwide coverage from the air to the sea, ground to space. Included in the new model is artificial intelligence with capable security. Dynamic resource allocation is essential to support the exponential growth of data traffic caused by holographic movies, AR/VR, and online gaming. This paper focuses on various resource allocation methodologies and algorithms using deep learning techniques like CNN, DNN, Q learning, deep Q learning, reinforcement learning, actor critic, etc. briefly. Optimal allocation of resources dynamically in real time can improve overall system performance. Consideration is given to computing, radio, power, network, and communication resources. To establish a solid theoretical foundation for the resource allocation in 6G wireless networks, several deep learning techniques and approaches have been examined. The key performance indicators such as efficiency, latency, resource hit rate, decision delay, channel capacity, throughput are discussed.

Automation of Rice Leaf Diseases Prediction using Deep Learning Hybrid Model VVIR

Sheikh Gouse ,Uma N. Dulhare

Abstract: The main cereal crop in the world is rice (Oryza sativa). As a primary source of energy, morethan 50 percent ofpopulation of the worlds relies on its use. Several elements impact rice grain yield and quality, such as rainfall, soil fertility, diseases, pests, weeds, bacteria and viruses. To control the diseases, the farmers invest a great deal of time and money and they identify problems with their poor unqualified techniques, which results in poor yield growth with losses. Technology in agriculture makes it easier than ever before to detect pathogenic organisms in rice plant foliage automatically. Convolutional neural network (CNN) is a deep learning technique used to solve computer vision issues such as image classification, object segmentation, image analysis, etc. In the proposed five models achieved the VGG16 98.43%, VGG19 98.65%, InceptionV4 98.57, ResNet-50 98.57% model to identify diseases in rice leaf images with a transfer learning technique. Using these model parameters, the final proposed VVIR model accurately classified objects with a accuracy of 98.80 %

A Review based on Machine Learning for
Feature Selection and Feature Extraction

R.S Preyanka Lakshme, S. Ganesh Kumar

Abstract: Feature selection (FS), which reduces data dimensionality and enriches the performance of any suggested framework, is one of the most crucial parts of machine learning (ML). In real-world applications, computational, large dimensionality and noisy or ambiguous nature, storage complexity, high performance, and other difficulties beset FS work.As a pre-processing phase, dimension reduction is used to improve the accuracy of learning features and reduce training time by removing irrelevant data, noise, and duplicated features. The feature selection (FS) and feature extraction (FE) methods were used to conduct dimensionality reduction (DR). Due to the increasing rate of data creation, FS is a practical method for addressing several serious dimensionality problems, like decreasing duplication, eradicating unneeded data, and enhancing comprehensibility in the outcomes. The efficiency of data processing and storage can be enriched by FE that handles the challenge of selecting the most distinct, instructive, and constrained collection of features. This research focuses on contemporary feature selection and feature extraction algorithms that aid in reducing data dimensionality.

Automating Scorecard and Commentary based on
Umpire Gesture Recognition

Medha Wyawahare, Amol Dhanawade, Shreyas Dharyekar.
Asavari Dhole, Mugdha Dhopade

Abstract: Cricket is the most played sport in the Indian subcontinent. While the sport enjoys abundant financial and human resources at the highest levels, the lower levels lack these resources which creates a resource parity between players playing at various levels. This paper aims to develop a system capable of detecting the various umpire signals from images and then automating the scorecard accordingly. The system uses a camera to capture the image of the umpire then a processor-based system is used to identify the signal and update the scorecard. In the detection process, the image is pre-processed and SIFT descriptor is applied to extract image features. The dimensions of the features is reduced with k-means and PCA. Finally, the classification of signals is done using 3 classifiers that are KNN, Decision tree and Random Forest. The model is trained with 6000 images of 6 classes which include Six, Four, Out, No ball, wide ball and a no action class. The random forest classifier gives the best accuracy at 81 percent. A novel algorithm is used for updating the scorecard. Audio commentary is provided through predefined templates.

Rating YouTube Videos: An Improvised and Effective Approach

Abhishek Jha, Arti Jha, Aditya Sindhavad,
Ramavtar Yadav , Ashwini Dalvi, Irfan Siddavatam

Abstract: YouTube is one of the best sources of video information on the Internet. While it serves as the best media for creators to communicate to a broad audience, it has become less user-friendly over the past few years. Some official changes to the YouTube app have triggered many global audiences. One significant change that took place in the past year was the removal of the dislike count from every YouTube video. Without a dislike count, the current YouTube rating system has become ineffective. The proposed work recommends more user-friendly methods over the current inadequate rating system. Some previous researchers like Alhujaili and Rawan Fahad[1] have already given insights on how sentiment analysis can be used on video comments to know the fairness of the video. So, the authors try to create a robust rating system that primarily uses sentiment analysis to provide fair ratings to every video depending on comment sentiment and would be easier to embed in the official YouTube app as a plugin. This rating system even helps to detect clickbait videos to a certain extent, making it much better than the previous systems.

Classification of Tweet on
Disaster Management using Random Forest

Ms.T.Kanimozhi , Dr.S.Belina V J Sara

Abstract: The disaster management is highly responsible for managing the evacuation and deploying rescue teams to reduce the loss of lives and properties. However, it is considered challenging to obtain accurate information in timely fashion from various regions of the affected zones. With the advent of social media and networks, the information dissemination on such events can sense wide information from different zones but the information is in unstructured form. It is hence necessary to acquire correct or relevant information relating to that event. In this paper, we utilize random forest (RF) model to effectively classify the information from tweets (twitter.org) to find the location in case of a natural disaster. The proposed classification engine involves the collects of tweets, pre-processing of texts, RF classification and the extraction of location and determination. The classification is made effective using a pre-trained word vectors that includes the crisis words and global vectors for word representation (GLoVe). This pre-training captures the semantic meaning from the input tweets. Finally, extraction is performed to increase the accuracy of the model and in addition it determines the location of the disaster. The experiments are conducted on a real datasets from recent hurricanes. The results of simulation shows that the RF performs in a better way than other existing models in terms of accuracy, recall, precision and F1-score. It is seen that RF classifies effectively the tweets and analyses the accurate location.

Numerical Investigation of Dynamic Stress Distribution in a Railway Embankment Reinforced by Geogrid based Weak Soil Formation using Hybrid Rnn-Eho

M. A. Balasubramani, Dr. R. Venkatakrishnaiah, Dr. K.V. B. Raju

Abstract: As the primary method of track support, traditional sloping embankments are typically used by railroad lines. Geosynthetically Reinforced Soil (GRS) systems, as an alternative to traditional embankments, have gained appeal, notably for high-speed lines in India. This system's reduced base area compared to traditional embankments means that less ground stabilisation, improvement, and land taking is necessary. The research's findings provide intriguing strategies that may be implemented into the way tracks are designed now to accommodate faster freight trains pulling greater loads. This research explains how to anticipate the bearing capacity of weak sand supported by a method of compacted granular fill over natural clay soil using a hybrid Recurrent Neural Network (RNN) and Elephant Herding Optimization (EHO) with Geogrid reinforced soil foundation. The exact prediction target for the proposed model was developed by using displacement amplitude as an output index. A number of elements influencing the foundation bed's properties, Geogrid reinforcement, and dynamic excitation have been taken into account as input variables. The RNN-anticipated EHO's accuracy was compared to that of three other popular approaches, including ANN, HHO, CFA, and MOA. Strict statistical criteria and a multi-criteria approach were principally used to assess the predictive power of the developed models. The model is also examined using fresh, independent data that wasn't part of the initial dataset. The hybrid RNN-EHO model performed better in predicting the displacement amplitude of footing laying on Geogrid-reinforced beds than the other benchmark models. Last but not least, the sensitivity analysis was used to highlight how input parameters might affect the estimate of displacement amplitude.

Efficient Intrusion Detection and Classification using Enhanced MLP Deep Learning Model

G. Gowthami

Abstract: Everyone has entered a new stage of the digital world during this era. The digital world has created numerous opportunities and facilities, but it has also become a threat to the data that is kept there. Internet security is seen by many enterprises as a major challenge. Organizations use a variety of methods, including firewalls, virtual private networks (VPNs), authentication, and encryption, to protect credential data. The primary goals are to protect network infrastructure security and internet communication security. The arsenal of technologies for securing security has expanded. One of the most recent advancements in security technology is intrusion detection. In this study, EMLP (MLP+PSO) is used to identify and categorise paper incursions which is been compared over ANN and MLP (MLP+PSO) deep learning models.. The dataset used for analysis is KDD CUP99 dataset. Among these models, Enhanced MLP (MLP+PSO) produces better outcomes in terms of accuracy of about 93%, precision of about 0.88, and recall of about 0.84 respectively. The tool used for analysis is python.

Classification of Medical Datasets using Optimal Feature Selection Method with Multi-Support Vector Machine

Dr. S. Silvia Priscila, C. Sathish Kumar

Abstract: Automated Diagnosis in healthcare is becoming an interesting study in recent time among the data scientists to predict and diagnose the conditions in patients. In this manner, analysis of plays a major part in detection and classification of disease and accurately diagnose the medical condition in patients. Most of the data mining task is held up with poor classification accuracy due to the presence of redundant or irrelevant data items. In this research, the issue of poor classification accuracy is addressed and is solved by developing a framework that involves a series of stages. This includes pre-processing, feature extraction and classification of data items. The study uses Optimal Feature Selection Method (OFSM) as its feature selection tool and Multi-Support Vector Machine as its classification tool. The experimental validation is carried out to study the efficacy of the proposed method over various datasets and the outputs are evaluated in terms of accuracy, specificity, sensitivity and f-measure.

Predicting Students' Outcomes with Respect to Trust, Perception, and Usefulness of their Instructors in Academic Help Seeking using Fuzzy Logic Approach

Dr. R.K. Kavitha, Dr.N.Jayakanthan, Ms. S. Harishma.

Abstract: An instructor's persona and efficiency contribute significantly to predicting the performance outcome of the students during examinations. The primary objective of this paper is to realize in what way fuzzy logic can be applied to predict the outcome of student's performance with three parameters (i.e.) trust, perception, and usefulness of the instructor while seeking help in academics. Fuzzy logic makes decisions based on the rules and ambiguous data given to the model. It is used to handle partial truth where the range varies from absolutely true and absolutely false. Here, the predictions were made using a Mamdani-type fuzzy logic method with three inputs and one output. The study used a descriptive survey research model. Questionnaires were used as a research instrument in the study and a predictive model using the Fuzzy Logic approach was designed. Data collected from 1250 students belonging to various colleges were used in the study. Analysis was done using the python language and the Fuzzy inference system was designed using MATLAB. It was found that the study variables 'trust in instructor' and 'instructor usefulness' were highly correlated. With the input variables trust, perception, and usefulness of instructors, the output variable 'end semester performance' was predicted using the model.

Prediction of Student Score Performance of Sentiment Analysis using Hybrid Cross Validation Machine Learning Techniques

Neha Singh, Umesh Chandra Jaiswal

Abstract: As a result of advancements in technology, one of the most beneficial and significant study areas nowadays is the forecast of educational outcomes on test results. In the subject of education, machine learning is incredibly beneficial, especially for evaluating student performance. This work suggests a hybrid cross validation machine learning technique to forecast student performance on sentiment analysis in order to enhance results. Additionally, alternative cross validation machine learning techniques already in use are contrasted with the suggested model. The study's findings demonstrate that the suggested hybrid cross validation technique yields the best compression outcomes.

Content based Movie Recommendation System using Feature Extraction

Bhagya A Koushik, Dr. Ramya R S, Deekshitha R S,
Venugopal K R, Deekshitha S

 Abstract: A recommendation system analyses the browsing history and user preferences and provides suggestions through a filtering technique. A movie recommendation system, or a movie recommender system, is a Machine Learning approach to predicting the users' film preferences based on their previous choices and behaviour. Content based Movie Recommendation System using Feature Extraction (CMRSFE) an advanced filtration technique that predicts the possible movie choices based on the user concerns and preferences towards a domain-specific item. In this work, the model mines the movie datasets to extract all the important information, such as, popularity, genres, keywords, overview, cast and crew, necessary for recommendation. The "TMDB-The Movie Database" dataset is made use of, to create the machine learning model for the recommendation system. Finally, the model recommends the top five movies as a recommendation to the user.

Ensemble of Deep Learning
Approaches for Detection of Brain Tumour

Prashant, Gargi Srivastava, Vibhav Prakash Singh

Abstract: A tumor in the brain is defined as the unconventional growth of cells in the brain, a few of which can lead to cancer. Brain tumors can be detected by applying Machine Learning as well as Deep Learning algorithms. Deeper networks perform better than the classification models designed with fewer layers. To obtain better generalization performance individual models can be combined to achieve ensemble learning. In this work, several unique models are connected using the Max Voting algorithm to determine tumors in the brain from scans obtained by Magnetic Resonance Imaging (MRI). The prediction of tumors in the brain is made quickly and with higher accuracy, which assists in giving the treatment to the patients.

A Comparative Study on Query Optimization
Techniques in NoSQL

Heena Patel, Dr. Prashant P. Pittalia

Abstract: In today's on-demand business process ingesting a large volume of data that is big data, becoming a very important concept in digitalization word, storage of data is increasing and quick development in cloud computing is on demand. Many growing companies have jumped a variety of data that are structured, unstructured and semi-structured. They do not contain the table and a key model like a traditional relational database which is lack data consistency and can't reach internet scalable and performance. To overcome these challenges new databases are known as NoSQL Databases. Now a day's applications have become more networked and social, and the number of data requests is also increasing, thus NoSQL databases are preferred rather than the traditional database. It is very challenging that which NoSQL model to use and how it is suitable for an organization's needs and how to retrieve a huge number of data in minimum response time. Retrieving quick data in NoSQL that is improve the query optimization techniques is a recent research area. The main idea of this paper is to give a review of the NoSQL database, different models, query processing, and query optimization techniques that can be used for improving performance and reducing response time.

Automatic Cotton Leaf Disease Classification and Detection by Convolutional Neural Network

Hirenkumar Kukadiya, Dr. Divyakant Meva

Abstract: One of the main causes of low yield and the destruction of cotton plant growth is the attack of leaf disease. In any crops like cotton, groundnut, potato, tomato identification and detection of leaf diseases controlling the spread of an illness early on is essential, as is help to get the maximum crop production. For developing nations, it costs more to classify and identify cotton leaf disease through professional observation using only one's eyes. Therefore, offering software or application-based solutions for the aforementioned tasks will be more advantageous for farmers in order to boost agricultural production and develop their economies. This research presents a convolutional neural network approach based on deep learning that automatically classifies and distinguishes cotton leaf diseases. The existing lots of work has been done on leaf diseases that are commonly occurring in many crops, but in this work an effective and reliable method for identifying cotton leaf diseases was proposed. The suggested method successfully classifies and detects three important cotton leaf diseases, which are very difficult to control if not discovered at an early stage. The suggested model for identification and classification uses convolutional neural networks of cotton leaf diseases with training and testing accuracy accordingly 100% and 90%.

Analytical Review and Study on Emotion Recognition Strategies using Multimodal Signals

Jaykumar M. Vala, Prof. (Dr.) Udesang K. Jaliya

Abstract: Emotion is very important in the field of decision-making, human recognition, and the social intercourse. Multimodal emotion recognition is the promising research area of computing as well as sentiment analysis. Here, the information is carried out by the signals with various natures for making the emotion recognition systems accurately. Nowadays, the several robust emotion recognitions were developed for handling various languages and cultures. Hence, this has been complex because of potential applicability of the emotion recognizers over wide range of various scenarios. This work present survey of 50 papers based on emotion recognition strategies. In addition, thorough investigation is done based on the year of publication, adapted methodology, implementation tool, employed datasets, evaluation metrics, and values of evaluation metrics. On the other hand, the analysis of the methods with respect to the merits and demerits of the methods are presented. Finally, the issues of existing methods considering conventional emotion recognition strategies are elaborated to obtain improved contribution in devising significant emotion recognition strategy. Moreover, the probable future research directions in attaining efficient emotion recognition are elaborated.

An Image Performance against Normal, Grayscale and Color Spaced Image

Atul Kumar, Radhesh Pandey, Kamal Kumar Srivastava,
Sumit Awasthi, Talha Jamal

Abstract: Generally, an image matching belongs to comparing the two images, with the simple concept i.e. When the two images match or comparable and how can this similarity be measured? Fast and robust feature detection and image matching have always been a very major and challenging task in itself along with the applications. In this paper, we are using normal, grayscale and LAB color spaced images and measure the recital of contrasting approaches for image corresponding, i.e., SIFT, SURF, and ORB. For this purpose, we manually transform original images into grayscale and LAB color spaced images and compute all the parameters on the basis of which evaluation is done such as the total of distinct points in images, the match-up percentage. By this, we will show that which algorithm works best and more robust against each kind of image.

Study of X Ray Detection using CNN in Machine Learning

Prof Neeraj Bhargava, Pramod Singh Rathore, Apoorva Bhowmick

Abstract: The coronavirus spread that started in Wuhan, China and spread across the world, affecting the best of the healthcare systems from the Lombardy region of Italy to India, the US, and the UK, required accurate diagnosis. A rapid assessment to ascertain whether or not a patient has COVID-19 is required by frontline clinicians. In this paper, we propose to deduce the presence of COVID-19 using X-ray images of the lungs through feature extraction. A convolution network model is built for binary classification of images into corona positive and negative using the deep learning framework on Python, Keras. Various studies using different classifiers such as CART, XGB-L and XGB Tree were studied, which used machine learning for detection of COVID-19 and yielded a very accurate diagnosis. In this particular CNN model, Google Colab is used to execute the algorithm. The dataset is trained and the validation accuracy obtained is more than 96%. This is a very cost-effective way of using machine learning for the classification of infected and non-infected cases since working on Google Colab doesn't require enormous computational resources..

Smart Healthcare Surveillance System using IoT and Machine Learning Approaches for Heart Disease

Santanu Basak, Kakali Chatterjee

Abstract: The Internet of Things (IoT) and Machine Learning (ML) based Smart Healthcare Surveillance System (SHSS) enhances the monitoring service quality of the present healthcare sectors. Efficient SHSS for specially heart disease is a challenging task. It involves collecting data of vital parameters of the body from different sensors (wearable sensors, implanted sensors), then filtering that to remove less important data, and finally data analyzing for taking the decision to provide proper treatment. Diseases can be caused by changing lifestyle or changing in lifestyle may be the symptom of a disease. IoT can provide services not only for detecting heart disease for future but also it can serve in emergency situations. The primary goal of this surveillance system is to monitor changes in a patient's health in order to predict heart disease and deliver appropriate medicine via an automated procedure in the real-time environment. The SHSS uses edge layer to provide real-time services and the cloud layer for further latency tolerable analysis. Security and privacy are inevitable part of SHSS as it works with sensitive data of the patients. So, data security and user access mechanism should be involved. In this paper we have proposed an architecture of SHSS for heart disease, and discussed and analyzed the efficiency of different ML algorithms for making prediction of heart disease

Detection of the Affected Area and Classification of Pests using Convolutional Neural Networks from the Leaf Images

Bhasker Pant, Durgaprasad Gangodkar, Dibyahash Bordoloi, Ankur Dumka,

Abstract: Insect infestation is the primary threat to vegetable crops. Using effective insecticides is one method for preventing pest infestation. The success of any effort to safeguard crops relies on their discovery of the pest or their presence as soon as possible. In the beginning, pests were identified by hand. This is a lengthy process that needs constant oversight from professionals. The infestation must be inspected, and the various pests must be classified, using an automated pest detection system. Pests and plant diseases may be identified and located with the help of a wide variety of modern tools and approaches. There is a high degree of efficiency and dependability in the use of image processing techniques in these methods. Before calculating the impacted area in the picture, the suggested model determines whether the leaf has been harmed. Then, convolutional neural networks were used to classify the found pest's location. By determining what proportion of the surface is infected, one may gauge the extent of the problem and act accordingly.

Early-Stage Detection Model using Deep Learning Algorithms for Parkinson's Disease based on Handwriting Patterns

Jainish Savalia , Shivani Desai , Rebakah Geddam ,
Pooja Shah , Hitesh Chhikaniwala

Abstract: Early detection of degenerative diseases is crucial in medical science. Disease like Parkinson's Disease is a neurological disorder affecting the brain control over the limbs and in turn affecting motor skills. Parkinson patients suffer from tremors and low dopamine levels resulting in anxiety and depression. Thus, an early diagnosis for such diseases become vital. But in many of the cases, by the time a clear diagnosis can be made, the disease has been progressed significantly. The most common and early symptom among all is the loss of motor control. Thus, the progression in loss of motor control can be easily detected using a computer aided system for quicker diagnosis. The proposed CNN model with an accuracy 84 for cross fold of 40% for the kinematics detection of a person with Parkinson in early stage using images and signals collected by a smart pen and tablet.

Farmright – A Crop Recommendation System

Dviti Arora, Sakshi, Sanjana Drall, Sukriti Singh, Monika Choudhary

Abstract: Agriculture is extremely vital to our economy and boosting the development of this sector always adds up to the economic & political value of our country. Health of all the crops grown is affected by various aspects including technological, biological, and environmental factors. The environmental facet particularly has been drastically changing, posing challenges in front of the peasants. They face a significant difficulty in determining the optimal crop for their farming region to maximize productivity and profit. For Indian farmers, there is no existing reliable recommendation mechanism. Giving an address to this issue, the study proposes a crop recommendation system based on a multi-label classification model which considers the location of peasants, composition of soil, and weather characteristics, and provides a ranked list of suggested crop seed to be produced for greater yield. Researchers compare many algorithms based upon the performance criteria and capabilities to develop the best recommendation model for crops. With a precision of 82.74%, a recall of 80.92%, and an F1 score of 78.67%, the most optimal model was revealed to be an RF Technique. The trained model proved advantageous in catering the farmers with a ranked list of crops deployed along with an interface for better user experience.

Corn Leaf Disease Detection using RegNet, KernelPCA and XGBoost Classifier

Tejas Chauhan , Vijay Katkar, Krunal Vaghela

Abstract: India is a developing nation, and agriculture is essential to the health of its economy as a whole. Given the importance of the agriculture sector, there is a need to improvise crop maintenance systems and deal with the effects of Diseases (Bacterial, Viral, Fungal) on crop production. It requires continuous monitoring as well as large team of experts for physical observation. Farmers do not always have access to adequate facilities or even know how to contact experts. Also large farms require a significant time investment and substantial cost to consult experts. Plant diseases also pose a threat to the income of smallholder farmers. Detecting diseases in each crop is a complex task and it consumes a lot of time for farmers to look after the maintenance of crops. Thus, farmers need a technology that can help them in maintaining the crop in an efficient manner. It is easier, quicker, and less expensive to automatically detect diseases by only examining the symptoms on plant leaves. In this paper, we present a technique to detect the disease on a Corn plant using leaf images and Transfer Learning. The proposed approach extracts features of leaf images using assorted pre-trained models of RegNet and it reduces the dimensionality of extracted feature set by utilising Kernel-PCA. For classification of the diseases it makes use of XGBoost classifier. The study proves that the proposed approach can achieve the accuracy of 96.74% considering different parameters. One such intelligent system can help not only the farmers, but can be helpful to Insurance Agents, Government Agencies and other organisations working for the betterment of farmers.

A Machine Learning Algorithm-based IoT-based Message Alert System for Predicting Coronary Heart Disease

Dhanamjayulu C, Grandhi Venkata Suraj, Madicharala Nikhil,
Rajesh Kaluri, Srinivas Koppu

Abstract: Coronary illness is one of the most dependable reasons for death in the world today. The expectation of cardiovascular action is a basic test in the zone of clinical information examination. AI has ended up being viable in aiding in settling on choices and expectations from the huge amount of information created by specialists or Health associations. It is getting more support to foresee coronary illness with various Machine Learning methods and it additionally causes individuals to take future solutions for dodge. The proposed a novel procedure that objectives discovering basic features by applying Machine Learning techniques, achieving improved precision in the assumption for cardiovascular infirmity. The proposed algorithm has an accuracy of 95.5% with a F-measure of 0.95. The forecast model is given different mixes of features and a couple of known ensemble methods. It will deliver an improved demonstration level with a proximity level of 95% through the assumption model for coronary sickness. It is also compared with existing models like SVM, KNN, Logistic Regression, Decision tree, and Naive Bayes. Future more presents, with a ready framework utilizing it and the specialist recommendation.

Development of Predictive Models of Diabetes using Ensemble Machine Learning Classifier

Madhubrata Bhattacharya, Debabrata Datta

Abstract: The discovery of knowledge from medical database using machine learning approach is always beneficial as well as challenging task for diagnosis. Diabetes if left undiagnosed can affect many other organs (e.g., kidney and liver) of human body and this particular disease is very common in all ages young to adult. Several researchers have attempted to predict via classification algorithms of machine learning. However, ensemble learning approach of classification of diabetes is missing in the parlour of classification algorithms of diabetes, indicating a research gap. This work presents classification algorithms for the prediction of diabetes based on machine learning using ensemble classifiers and in our work four classifier models, viz., (a) Random Forest (RF), (b) Bagging, (c) AdaBoosting and Gradient Boosting are used. Classification of the diabetic such as non-diabetic (labelled as 0) and diabetic (labelled as 1) of ensemble classifiers implemented for the present work is reported using metrics such as precision, recall, accuracy and F1-score. Results show that numerical value of accuracy of random forest model is 0.75 whereas accuracy of Bagging, AdaBoosting and Gradient Boosting ensemble classifiers is 0.72 , 0.71 (0.75 with best parameter) and 0.75 (0.76 with best parameter) respectively. Accuracy of Gradient Boosting ensemble classifiers with respect to prediction of diabetes being 0.82, it can be mentioned that Gradient Boosting is the best among all other ensemble classifiers attempted to predict diabetes. A PYTHON code „ENSEMBLE‟ has been developed for our computation. Our future task towards the classification of diabetes will be based on metaheuristic algorithms and deep learning.

Clustering & Association Rule Mining of Cardiovascular Disease Risk Factors

Zahiriddin Rustamov

Abstract: Cardiovascular diseases (CVDs) are the leading cause of death glob-ally, with millions of lives lost yearly. CVDs are a group of disorders of the heart and blood vessels. Although there are no exact causes of CVDs, there are risk factors associated that increase the likelihood of getting CVDs. Clustering and association rule mining are among the methods used for pattern discovery. However, not much research has been proposed to compare clustering and as-sociation algorithms regarding risk factors of CVDs. Hence, this study presents a comparative analysis of clustering and association on the risk factors of CVDs to assess which factors are significant. The Framingham Heart Study dataset was used for clustering and association rule mining. The clustering results using three clusters show that older age, high BMI, and high systolic blood pressure are the significant risk factors. Smoking and hypertension are among the risk factors contributing to angina and heart attack based on association analysis with minimum support, minimum confidence, and maximum items of 25%, 60% and 4, respectively. This study successfully adopted clustering and association for pattern discovery to assess the most critical risk factors of CVDs.

Improving Architectural Reusability for Resource Allocation Framework in Futuristic Cloud Computing using Decision Tree based Multi-Objective Automated Approach

Husain Godhrawala, Dr. R. Sridaran

Abstract: Cloud computing is a highly popular computing technique. Cloud combined with IoT, fog, edge, and mist computing in 5G networks gives us real-time and highly predictive responses leading to a better and smart life. It requires a highly robust and integrated cloud administration, especially cloud resource allocation. Artificial intelligence and machine learning can be easily implemented along cloud design patterns for efficient resource allocation. In this paper we discuss multi-tenant cloud resource allocation problem. We propose to use a rule-based analysis pattern to dynamically reconfigure resource allocation pro-cesses. The pattern uses various attributes of clouds, resources, subscribers and requests along with heuristic data like configurations, policies, strategies, and methods to efficiently identify and apply rule of allocation. We implemented a decision tree to assist pattern to have automated decisions, which rule to follow. The pattern caters for multi-objectivity, simplifies architecture, enables the ex-tension of the cloud framework and makes it possible to interact easily with cloud. This paper describes the architectural framework pattern, which learns from itself. This paper presents CK's object-oriented metrics comparisons of pat-tern-based object-oriented code. The comparison shows that object-oriented code improves code quality, making pattern-based code more maintainable, flexible, extendable and secure.

Recent Trends in Modalities and Deep Learning Methods for Breast Cancer Detection

Iqra Nissar, Shahzad Alam, Sarfaraz Masood

Abstract: Automated and intelligent healthcare using deep learning has produced promising results in both diagnosis of diseases and precision medicine. Disease diagnosis without any human intervention has gained prominence among clinicians recently. Breast Cancer, the most prevalent type of cancer in women is the major cause of death among them. Therefore, its diagnosis is crucial in the early stage to lower the death rates. The use of medical imaging in the identification and diagnosis of breast cancer is highly recommended. The literature has offered several modalities, demonstrating a keen interest in several research areas. In pertinent medical domains, each modality has a significant role to play. This study has examined the benefits and drawbacks of various imaging techniques for diagnosing breast cancer, including mammography, ultrasound, and MRI. Using various imaging modalities, the techniques developed to make it easier to divide breast cancer into cancerous and non-cancerous classes. A quick insight into the modalities and subsequent machine learning and deep learning applications that have been widely used in the diagnosis of this disease is the major goal of this study.

Development of Deep Learning based Predictive Models for Semen Quality Analysis

C. Shanthini, Dr. S. Silvia Priscila

Abstract: Quality of the semen has a very important part of pregnancy. Sterility has many side causes and is one of the main reasons for the inability of the pairs. There is a way for detecting the ability of the semen which causes pregnancy by checking the quality of the sperm through clinical diagnosis. The overall concept of this work is to improve the prognostic methods for the national infertility monitoring system for accelerating and enabling the prevention, analysis, and follow-up of infertility. This work utilizes the WOA method for identifying the major features of the semen dataset. Deep Learning (DL) models like DT, RF, SVM and CNN are utilized for classifying the dataset. These methods are created for accomplishing the dependable and high grouping exactness of infertility analysis; anticipating original quality from a way of life data is becoming conceivable. The exhibition of the classifiers was evaluated on the basis of Accuracy, Precision and Recall values. The results shows that proposed CNN+WOA produces better results than other algorithms with Accuracy 95%, Precision 0.94 and Recall 0.89 respectively. The tool used for evaluation is python.

An Energy & Cost Efficient Task Consolidation Algorithm for Cloud Computing Systems

Sachin Kumar, Saurabh Pal, Satya Singh,
Raghvendra Pratap Singh, Sanjay Kumar Singh, Priya Jaiswal

Abstract: The power consumption of untapped resources, especially during a cloud background, represents a significant sum of the specific power use. By its nature, a resource allotment approach that takes into account the use of resources would direct to better power efficiency; this, in clouds, expands even additional, and with virtualization techniques often jobs are easily combined. Job consolidation is an effective way to expand the use of resources and sequentially reduce power consumption. Current studies have determined that server power utilization extends linearly with processor resources. This hopeful fact highlights the importance of the involvement of standardization to reduce energy utilization. However, merging tasks can also cause freedom from resources that will remain idle as the attraction continues. There are some remarkable efforts to decrease idle energy draw, usually by putting computer resources into some kind of power-saving/sleep mode. Throughout this article, we represent 2 power-conscious task reinforcement approaches to maximize resource use and explicitly consider both passive and active power consumption. Our inferences map each job to the resource at which the power consumption to perform the job is implicitly or explicitly reduced without degrading the performance of that task. Supporting our investigational outcome, our inference methods reveal the most promising power-saving potential.

Experimental Study on VM Allocation Algorithms in SDN-Cloud Environment

Amirah H. Alomari, Shamala K. Subramaniam, Normalia Samian,
Rohaya Latip, Zuriati Zukarnain

Abstract: Resource allocation in any distributed system is critical concern due to its involvement tasks that are linked to the success or failure of a system. On the other hand, Quality of Service and network performance are major concerns as it outlines the overall architecture of the system. In conjunction with new advancement in the highly networking based era, new resource allocation techniques are constantly developed to manage the changes and its implications. Software-Defined Network(SDN) shifts the traditional architecture of distributed systems to a new level. The main controlling element in SDN is located in a centralized unit where the controller unit is responsible on allocating incoming requests to available resource based on pre-defined conditions. Due to its ability of the controller to observe the entire network, the controller unit is capable of making decision based on network states. Relatively distributed networks such as Cloud and Fog are influenced by the concept of SDN. In this paper, we focus on SDN based Cloud to study the performance of different virtual machine (VM) allocation algorithms under different traffic load conditions. This study is conducted in a simulation environment using CloudSimSDN and real workloads. Results show that different VM allocation perform differently under various traffic load conditions. However, First Come First Served FCFS algorithms outperform in most scenarios.

A Comprehensive Study on Cyber Legislation in G20 Countries

Nisarg Mehta, Priyansh Sanghavi, Manish Paliwal, Madhu Shukla

Abstract: Cyberlaw, often known as Internet law, is a branch of the judicial framework concerned with the legality of internet information technology. It governs the digital transmission of information, shoppingportal applications, and information security. It is associated with justice informatics and electronic components like systems, software, and hardware. This article covers various topics, including the existence and appropriateness of the open Internet, free expression, and online privacy. The standards contribute to a significant decrease in the number of people engaging in asymmetric warfare and also help to restrict their participation by safeguarding illegal access to information, free speech connected to Internet usage, personal space, information exchange, e - email domains, intangible assets, machinery, and web services, which include data storage devices. As internet traffic increases, so does the number of legal challenges worldwide. Because internet laws differ nationwide, reprisal can range from bedframes to jail, and police agencies can be hard to implement. Cyberlaw protects persons who utilize the Internet or operate an online company. Internet users need to grasp their country's local community and cyber legislation to identify whether behaviors are allowed or prohibited on the network. They can also keep us from engaging in illegal activities.

Image Encryption Algorithm based on Timeout, Pixel Transposition and Modified Fisher-Yates Shuffling

Sangeeta Sharma, Ankush kumar, Nishant singh Hada,
Gaurav Choudhary, Syed Mohd Kashif

Abstract: Social media has become an inseparable part of our lives which has increased the sharing of images across multiple platforms. To enhance the security, various image encryption algorithms are being used but there are still are a few areas that can be improved. First, the data transmission mostly includes the original image which can be secretly read by a middle man. Second, the sender loses control over the image after sharing. Third, generally, encryption keys are of fixed length and long which take up more memory & efforts in sharing them securely. Fourth, the key-space of algorithms is fixed, thus allowing an upper limit estimation to any brute force attack. In our work, we propose a timeout based symmetric key column-row transposition encryption algorithm for images providing the same level of security irrespective of the key size. The timeout feature allows the sender to specify a time until when the image can be decrypted by anyone. With the algorithm, we present an Android Library that implements this algorithm and provides ability to prevent unauthorized sharing of images in apps. To support other platforms as well, we present NPM & Python Package. Various performance measures were used to test the efficacy of the algorithm.

EXAM: Explainable Models for Analyzing Malicious Android Applications

Asmitha K.A., Vinod P., Rafidha Rehiman K.A., Raman Praksh Verma,
Rajkishor Kumar, Surbhi Kumari, Nishchaya Kumar

Abstract: The open source nature and high performance have made Android smartphones popular world wide. On the other hand, the ease of usage and popularity has prompted malware creation. The proposed method presents a lightweight solution capable of detecting unknown malware on Android smartphones based on static analysis of android .apk files. here we extract three different kinds of features i.e. permissions, activities and receivers, in order to evaluate if individual features are effective in detecting malware. Experiments suggest that our proposed deep learnig detection method is able to identify Android malware with an overall classification accuracy of 97.35% using boolean representation of the feature vector table. Comparative analysis of individual features recommends that the deep learning model resulted in better detection rate with permission feature. We also performed obfuscation of selected malware .apk files and found that the detection rate of our trained model is about 100%. Moreover, we also show how explainability helps the analyst to assess different models.

Data Encryption Approach using Hybrid Cryptography and Steganography with Combination of Block Ciphers

Het Shah, Parita Oza, Smita Agrawal

Abstract: Information security has been one of the prominent fields due to the concerns regarding it, for the past few decades. Any loopholes in these may lead to dire consequences depending upon the importance of the message being transmitted. Thus there have emerged many techniques for this purpose, one such is crypto steganography which has been implemented in this paper, our algorithm uses a combination of Advanced Encryption Standard (AES) and columnar block ciphers to encrypt message and embedding it into the image using 1-Least Significant Bit (1-LSB) method and the reverse is done to get the data back at the other end. Hence this algorithm adds another layer of security with strong encryption techniques while maintaining the structure of the image. There is low distortion in the image with Mean Squared Error (MSE) as 0.028, Peak Signal-to-Noise Ratio (PSNR) as 63.719 and Structural Similarity Index (SSIM) values as 0.999 for png image and 0.044, 61.728, 0.999 respectively for bmp image.

Mitigation and Prevention Methods for
Distributed Denial-of-Service Attacks on Network Servers

Kwitee D. Gaylah, Dr. Ravirajsinh S. Vaghela

Abstract: Present-day different network-based attacks increased rapidly as internet-based communication increased. Recent DDoS attacks noticed throughout the Ukrainian government, defense, and banking websites. DDoS attacks become a major threat because the different vectors of malicious attacks increased this year with different motivations. This paper shows a cutting-edge overview of DDoS attacks, defense strategies, and migration methods. This article gives a systematic analysis of DDoS attacks that include the classification of different sorts of DDoS attacks and their mitigation and preventative methods. This research study examined well-known preventative and mitigation approaches. Additionally, it provided an overview of various attack kinds, filtering strategies, and attack detection approaches. It outlined the salient aspects of the attacks as well as the benefits and drawbacks of various forms of defense.

A Machine Learning Framework for
Automatic Detection of Malware

Syed Shabbeer Ahmad, Atheequllah Khan,Pankaj Kawadkar,
Imtiyaz Khan, Mummadi Upendra Kumar, Shravani D

Abstract: Cyberspace is every expanding with inclusion of diversified networks and systems. With the emerging technologies such as Internet of Things (IoT) and distributed computing, there is seamless integration of heterogeneous applications with interoperability. This has brought unprecedented use cases and applications in various domains. Unfortunately, there is every growing threat to cyberspace due to different kinds of malicious programs termed as malware. Since adversaries are developing various kinds of malware, its detection has become a challenging task. Of late, machine learning (ML) techniques are widely used to solve problems in real world applications. Plenty of supervised learning methods came into existence. The objective of this paper is to explore and evaluate different ML models with empirical study. In this paper, we proposed a ML framework for analysing performance of different prediction models. An algorithm known as Machine Learning based Automatic Malware Detection (ML-AMD) is proposed. This algorithm is used to realize the framework with supervised learning. This empirical study has resulted in knowledge about ML models such as Decision Tree (DT), Logistic Regression (LR), Random Forest (RF), Multilayer Perceptron (MLP) and Gradient Boosting (GB). Random Forest model has exhibited highest accuracy with 97.96%. The research outcomes in this paper help in triggering further investigations towards automatic detection of malware.

DNNdroid: Android Malware Detection Framework based on Federated Learning and Edge Computing

Arvind Mahindru, Himani Arora

Abstract: The fact that apps are available for free via Android's o_cial store has helped the platform become more popular. The functionality of Android apps is reliant on permissions. Due to these permissions, cybercriminals developed malware-infected apps for smartphone users. The main fault lies in the permission model of Android. To address this issue, a framework entitled _DNNdroid_ is proposed that work on the principle of federated learning. Information related to newly installed apps is stored on the user's device only and this information is not revealed to the developer. In the meantime, input from all the users is collected simultaneously to train the model with a federated learning process, so that a better classi_cation model is developed. The main challenge in this is that a user is not able to identify whether an app is malwareinfected or not. The experiment result reveals that the cloud server has an F1 score of 97.8% having a recall rate of client than 0.95 false positive rates using 1,00,000 unique Android apps with 500 plus users and 50 rounds of the federation. Further, an experiment is performed by using frameworks available in the literature and di_erent anti-virus scanners.

An Improved Symmetric Key Encryption Method using Randomized Matrix Generation

Karan Padhiyar, Divyang Chauhan, Riya Solanki, Debabrata swain

Abstract: Currently, digital data security has appeared as the largest challenge before the society. This concern has become more serious due to the data movement through the unsecured wireless medium. The text format data are mostly targeted by different attackers because of its usage in various finance and other sectors. Different advanced approaches were proposed for securing text data but security concern still remains. In the proposed method a symmetric key cryptographic algorithm is developed for securing the text data. The encryption and decryption key is generated through a set of matrix operations. The Key is generated by the multiplication of random matrices followed by a determinant operation of the same transposed and conversed matrix. The performance of the proposed method is compared with a few existing algorithms using throughput expressed in kilobytes per second. The result analysis has shown that the proposed work with both variations performed well compared to all other discussed algorithms.

Performance Analyses of Black Hole Attack in AODV Routing Protocol in VANET using NS3

Dhananjay yadav, Nirbhay K. Chaubey

Abstract: VANET(Vehicular ad hoc network) is an extension to MANET(Mobile Ad Hoc Network) that is mainly used for providing communi- cations between different vehicles in the network. It is an emerging technology which will play a major role in furnishing intelligent transportation system. Vehicles become able to pass messages to each other, send alert message in case of accidents and inform other vehicles about traffic situation on road. Vanet has high advantage for safety and security of people in network but due to high mo- bility of vehicle and frequent topology changes creates numerous security is- sues also. Besides various security issues, one of the main security issues in VANET is the Black Hole Attack (BHA) in which attacker, at the time of rout- ing impose itself that it has shortest route for communication and hence legiti- mate nodes starts communicating with that attacker node. Now the attacker node can drop the packet or pass the packet to other malicious node. In this re- search paper the performance in vehicular network is compared at time of black hole attack and without attack in AODV routing Protocol. Simulation has been carried out using NS3 and the result shows that packet delivery ratio decreases with less throughput in case of attack.

Comparative Analysis of Several Approaches of Encoding Audio Files

Mr. Lakhichand Khushal Patil, Dr. Kalpesh A. Popat

Abstract: The use of cryptography is essential to ensure confidential communication across networks. Concerns about the safety of digital data as a result of its fast expansion has increased the need for the development of more sophisticated methods of cryptography. Cryptography is a procedure that rearranges and replaces content inside the information in order to scramble it, making it unintelligible to anybody other than the person who is capable of deciphering it. This becomes cryptography a sort of information security. This process is known as encoding. Cryptanalysis, sometimes known as "breaking the code," refers to the process of deciphering a communication even when the decipherer has no idea how the information was encrypted in the first place. The use of encryption is no longer restricted to just textual information. There are algorithms for a variety of data types, including images, audio, and video, amongst others. A few of the criteria that are considered while evaluating cryptographic algorithms are throughput, speed, CPU time, battery power consumption, and memory requirements. In this work, an investigation into many commonly used algorithms like as RC6, RC4, ThreeFish, Twofish, Blowfish, AES, 3DES, and DES is carried out on the aforementioned parameters in order to locate the most effective solution. This work's objective is to provide a comprehensive introduction to a few of the already-present cryptographic approaches and their respective work quality for a wide variety of data types, with a particular emphasis on audio file encryption.

A Secure Mechanism for Safeguarding Cloud Infrastructure

Khare Pratyush, Vivek Kumar Prasad, Rachana Mehta, Madhuri Bhavsar

Abstract. Security is frequently viewed as the largest impediment to a cloudbased approach, but in actuality, it can be the major enabler. Cloud security guarantees that your information and apps are easily accessible to authorized users. In this paper, we shall be putting forward, the cloud ecosystem's security concerns. The most crucial concerns for the popularity of cloud computing services are privacy and security. Here we try to depict a study of data that is hosted on the cloud and the issues in its security. The study will examine the particular data protection practices used globally to offer optimum data security while reducing threats and risks. Although many apps benefit by having access to data on the cloud, but doing so poses concerns since it makes data accessible to apps that could already contain security flaws. Analog to this, data may be at risk if a guest OS operates on top of the hypervisor, without consideration for dependability of the guest OS, resulting in a flaw in security. The paper ends with a case study where the request has been classified as safe or malicious. If the malicious request is identified, then these requests are to be discarded so that the cloud remains safe. The classification has been conducted using Machine Learning and Deep Learning concepts and an accuracy of 85% has been achieved.

Phishing URLs detection using Machine Learning

Wend-Benedo Simeon ZONGO, Boukary KABORE,
Dr. Ravirajsinh Sajubha Vaghela

Abstract Nowadays, internet user numbers are growing steadily, covering online services, and goods transactions. This growth can lead to the theft of users' private information for malicious purposes. Phishing is one technique that can cause users to be redirected to sites with malicious content and steal all of their information. The main purpose of phishing is to steal user identities such as online credentials, bank transaction details, etc. As technology advances, the mechanism of phishing attacks begins to take place, so to prevent it from happening, some mechanism anti-phishing is used to detect phishing links or URLs Machine learning is the most solutions tools against phishing offensive, and with its algorithms, we can rank all content and determine whether it is phishing or not. We tested cross-validation as well as the correlation between features. Using Logistic Regression, we determined the importance of the features. Finally, we tested the Multinomial Naïve Baye classifier. We found that the Logistic Regression classifier had better accuracy for the best accuracy.

Android Malware Detection with Classification bsased on Hybrid Analysis and N-gram Feature Extraction

Eslavath Ravi, Mummadi Upendra Kumar

Abstract. Mobile devices will have the potential to expose to various cyber-attacks with the explosive growth of mobile networks. Unknown malware may proliferate dramatically in areas where existing security software is incapable of detecting it. As a result, it is critical to propose a new malware detection classification method. In this paper, an n-gram hybrid analysis-based approach is used to extract all n-gram byte codes from training samples, as well as the most rel - evant attributes, which are planned to be selected. The test samples are determined to check whether they are malware or benign and thus malware samples are classified and detected using a convolution neural network (CNN) classifier.

Execution based Comparison of Quantum Cryptography Protocols

Ajanta Das, Shalbani Das

Abstract: With the advancement of science and technology, cyber cryptography is classified into classical and quantum cryptography. Unlike classical cryptography, the public key is not shared between sender and receiver before communication, in case of quantum cryptography. In quantum cryptography, secret key is shared using quantum key distribution methodology. Quantum key distri-bution is based on qubits and fundamental theory of quantum mechanics. In this paper two quan-tum cryptography protocols, BB84 and E91 are presented with the basic theory, algorithm and implemented circuit in qiskit. The objective of this paper is to compare and analyze the quantum cryptography protection protocols, BB84 and E91 varying number of qubits.

Challenges of Collecting Cyber Threat Intelligence from Hacker Forums

Ashwini Dalvi, Nishita Dhote, S G Bhirud

Abstract: Hacker and dark web forums have become popular among cybercriminals, where a range of topics can be discussed freely, including tutorials and materials for learning hacking or even launching a cyber-attack. Researching and monitoring these forums can help cybersecurity professionals gain valuable insights about the trending terms, vulnerabilities, and exploits discussed in dark web forums. Additionally, Hacker forum investigation can help proactively detect cyber-attack and situational awareness. Hacker forums available on the open, deep, and dark web are potential cyber threat intelligence (CTI) sources. However, the challenges in collecting and analyzing data may make CTI goals and objectives difficult to achieve with hacker forums.The present work discussed the limitations and challenges associated with using data from hacker forums to CTI.

The Scrutiny on Critical Infrastructure Owners Referencing Privacy Violating Towards with the Open-Source Intelligence Threat Evaluation Framework

Dr. Jigneshkumar A.Chauhan, Achyuttam Vyas, Dr. Satyen M.Parikh

Abstract: OSINT stands for Open-Source Intelligence Technique. OSINT includes all non-authorized and all openly available sources of information, this information we can access either online or offline, in the airwaves and on paper. In cyber security world, OSINT plays an important role. It is the initial part of hacking which is also known as reconnaissance – information gathering. The more information we can gather about our victim, the easy it will be for us to get into the organizations network and exploit the vulnerabilities present in the organization. As world is getting attracted and addicted to digitalization the more and more users and organizations privacy and data is at risk. Attackers are getting smarter day by day with their skills and techniques they always try to be creative with their new fond of attacks. In same way the Critical Infrastructure Sector has now been a target for attackers as these can lead to many disastrous things example: - Stuxnet and Black energy. In this paper we are going to target Pharmacy Sector using PV OSINT Framework to identify all the issues / vulnerabilities which can help organizations to mitigate the vulnerabilities so that they are saved from future cyber-attacks.

Image Processing and Deep
Neural Networks for Face Mask Detection

Mrunali Mahesh Wakarekar, Prof. Dr Uma Gurav

Abstract. The proper use of a mask is crucial for lowering COVID 19 and transmission. According to the research, transmission is completely decreased when the mask is used appropriately. Factors like sunlight and several items can affect how appropriately applied face masks are classified and detected. Cotton masks, sponge masks, scarves, and other options greatly lessen the effect of personal protection in such circumstances. The research suggests a novel modified formula for classifying masks into three categories—a proper mask, a no mask, and an erroneous mask—using deep learning and machine learning. First, we provide a brand-new face mask classification and detection algorithm that combines deep learning, the viola Jones method, and Efficient-Yolov3 Wearing a mask, not wearing a mask, or wearing the wrong mask are the three options. On the dataset with or without mask pictures, the suggested system outperforms and is more accurate when compared to existing techniques. The results of experiments and analysis are also based on the classification knowledge set. In comparison to the present methodology's categorization accuracy of 84%, the anticipated formula boosted it to 97%.

An Analysis of Lightweight Cryptographic
Algorithms for IoT- Applications

Dr. Jigneshkumar A.Chauhan, Mr.Ankitkumar R.Patel,
Dr. Satyen Parikh, Dr. Nilesh Modi

Abstract. With the arrival of advanced technologies, IoT has enabled the connection of many devices that can collect huge amounts of data. IoT security requirements are therefore supreme. Cryptography is used to secure the confidentiality, data integrity, authentication and control access to networks. To provide a complete overview of this field, we have compared some existing algorithms based on hardware and software performance and expectations of different attacks. We also discussed the requirement and direction of novel research in lightweight cryptography to improve security and performance. This paper presents the performance comparison of their memory, latency & throughput, Area (GE), Key & Block size and other parameters of hardware and software efficient LWC algorithm. Primarily for lightweight block ciphers and further shows new research directions for developing new algorithms with the performance, security, and cost characteristics.

Permissioned Blockchain based Solution to Document Processing in the Real Estate Industry

Vishalkumar Langaliya, Jaypalsinh A. Gohil

Abstract: For Blockchain Technology, Real Estate is a particularly excellent target since it has a complicated transaction process that is designed to prevent fraud and enable stringent ownership protection. The real estate industry demands these characteristics, and this is where blockchain excels. Blockchain Technology can be used to enhance System openness making it possible for regulators to identify and stop fraudulent activity. Blockchain technology and the fundamentals of the Indian real estate market are introduced in the first section of the article. The second section summarizes recent research in the area of interest and points out research gaps. The framework and suggested algorithms for document processing in the Indian real estate sector are shown in the third part. The implementation of the proposed algorithms with tools and technologies is suggested in the final section. Using the permission blockchain, the proposed algorithms can be put into practice as chain code. The suggested algorithm's ultimate purpose is to preserve transparency, record integrity, and trust factor in the targeted area to encourage openness, integrity, availability, and trust.

Automatic Evaluation of Free Text Answers : A Review

Nirja Shah, Dr. Jyoti Pareek

Abstract: In the area of Artificial Intelligence where human-computer in-terac-tion is possible using natural languages like English, Hindi, Gujarati. NLP is used to summarize text, translation of text to other languages, accessing an-swer scripts of students, recognizing emotions, virtual assistance etc. In the modern era, eval- uating answer scripts automatically with accuracy and con-sistency would be a great help for various Universities, Schools, Colleges and institutes. In this re- view paper we have given an overview of systems that have been developed and engineered till date. Also, we have discussed different approaches that are used and the accuracy that has been attained by the research-ers. Though there are many systems which evaluate descriptive answers automat-ically with great accuracy for the English language, for Indian local languages like Hindi there is a vast scope to develop such systems.

Blockchain Federated Learning
Framework for Privacy-Preservation

Sameera K.M., Vinod P, RafidhaRehiman K.A.,
Jifhna P.N., SandraSebastian

Abstract: Real-time data for machine learning introduced challenges, especially security and privacy issues, while sharing critical private data. The proposed unified federated learning system threaded with blockchain technology is a solution for personal communication over decentralized networks and challenges related to traditional machine learning. Federated Learning (FL) ensures the client's local data privacy. The blockchain part of the system helps the server to authenticate local models from the client and introduces a notion of trust. FL-based Logistic Regression, Support Vector Machine (SVM), and Artificial Neural Network (ANN) models have experimented on two different domains: network traffic and healthcare. To assess the system's validity, we have used three benchmark datasets-KDDCUP99, NSL-KDD, and Pima Indians Diabetes Database. Numerical results demonstrated that the proposed approach is efficient for reliable and private communication over a decentralized network. For KDDCUP99 and NSL-KDD dataset achieves 99% and for Pima Indians
Diabetes achieves 65.88% accuracy using the Fl-based ANN model. Additionally, we evaluate the performance of the FL model integrated with blockchain for privacy and security.

Path Planning and Static Obstacle
Avoidance for Unmanned Aerial Systems

Pranshav Gajjar, Virensinh Dodia, Siddharth Mandaliya,
Pooja Shah,Vijay Ukani, Madhu Shukla

Abstract: The recent advent of computational intelligence and the field of deep learning has shown a significant application for the task of efficient navigation of automated and unmanned vehicles. The notion of a robot intelligently deciding a path based on minimalistic spatial knowledge and operating in a collision-free manner illustrates significant realworld importance. This paper offers a novel study for determining the best strategy for robust path planning in a simulated environment sufficed with static obstacles. The paradigm of behavior cloning and imitation learning is extensively explored, these techniques have depicted a better analogy to the human brain hence, justifying the experiments.
This paper also conducts extensive tests on the existing technologies as baselines for an unbiased comparison, these algorithms include Rapidlyexploring Random Tree (RRT), A* search algorithm, and an improved rendition of the Ant Colony Optimization (ACO). The algorithms developed are centric to Unmanned Aerial Systems (UAS) however a correlation is also shown to unmanned ground systems and other automated robotics.

Comparative Study of Various Algorithms for Vehicle Detection and Counting in traffic

Anand Johnand, Divyakant Meva

Abstract: Now a days massive traffic queues and accidents are very much there in the Indian roads. Traffic Management is a critical issue which influences us all things considered, regular. Use of knowledge, for example, IoT and picture dealing with can move a smooth traffic supervision structure. To avoid clashing of vehicles during the signal, we can analyze the traffic crowd conditions and arrange the movement of the vehicles in the cross road in such a way that there should not be any collision and the traffic in each side of the road should get equal priority. If the traffic is less in any side of the road, then there is a need to change the priority and the side where the traffic is higher is given higher priority for movement. These traffic movements can be analyzed by taking the photos in the cameras and the pictures can be checked by using the fastest algorithms of object discovery. In this paper various comparison is done for analyzing the traffic movements by using the different kinds of object discovering algorithms like YOLO v3, YOLO v4, YOLOv5, YOLOv6 and YOLO v7.

IoT Security –A Secure Data Transfer Among IoT Nodes

Dwarakanath G V, Dr. R Sridaran

Abstrct: The phrase "IoT" (IoT) designates a concept that encompasses a wide range of object types and communication methods. Today, the term "IoT" is more often used to refer to the notion that everything is accessible online. IoT will be essential in the future since the concept opens up the door for additional services and advancements. Since they continue operating in unprotected exterior, all products will be intertwined and allowed to converse with one another. This latter element causes significant security issues. Today's Internet of Things (IoT) requires a standardized and transparent architecture that outlines how well this innovation should be used when IoT devices should safely communicate with one another. The methods used by technology to collect and process data are at the core of the security problems. The Iot is introduced in this thesis along with some potential applications and information security concerns. The thesis also provides some suggestions for potential fixes to the basic issues with identification and secure communications. The offered solutions are built on both the newest technology and that which is still in development. Modern solutions are constructed upon security measures like IPSec and DTLS. These protocols are used in a context that includes the Web and a 6LoWPAN network. The proposed authentication method is built on the open vital infrastructures and certificate management trust models. The paper lists various areas in which this theory may be applied for additional research. These areas of competence include additional vulnerability assessments and deployment of the indicated fixes.

Integration of the Internet of Things with Light Fidelity: Potential challenges A review

Rozin Badeel, Shamala K. Subramaniam,
Zurina.M. Hanapi, Abdullah Muhammed

Abstract: With the rapid growth of connected devices, new issues emerge, which will be addressed by boosting capacity, improving energy efficiency, optimizing spectrum usage, and reducing cost, while offering improved scalability to handle the growing number of linked devices. This can be accomplished by integrating Light Fidelity (LiFi), which is known as one of the newest communication technologies that aim to improve the current technology by employing visible light communication (VLC) and the Internet of Things (IoT). LiFi represents an efficient solution for many IoT applications and use cases, including indoor and outdoor applications. However, given the availability of few academic works attributed towards studying these two technologies, integration together has been challenging and warrants considerable attention. Therefore, this research aims to present a review of LiFi technology integration with IoT. Many aspects presented in the literature, however, the focus of this review has been given to LiFi's overall characteristics and integration of a variety of cases and presenting its general challenges, followed by the integration opportunities and challenges of both IoT and LiFi. This work provides avenues for new research pathways and opportunities within the rich areas of LiFi and other technologies currently being extensively used and those that will be adopted in the future. It will also enable researchers to understand this area more deeply and its associated applications.

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Smart Computing, Industry 4.0, and Information Security have become extremely crucial in the era of Artificial Intelligence. Marwadi University feels proud to host its first International Conference on Advancements in Smart Computing and Information Security (ASCIS-2022) that aims to bring forth academicians, researchers, and industry practitioners on a single platform for presenting their relevant ideas at this suitable platform. The Conference intends to bridge the gap between industry and academia through research intervention from the top leaders in intelligent computing and security. We believe this unique approach would create more opportunities for the scientific community to contribute fruitful research solutions. Globally eminent experts from Academia and Industry have consented to be the founding members of the ASCIS-2022, including the top 2% of the global scientific researchers from the Stanford list and industry who are our general co-chairs, programme chairs, industry-academia initiative, and track chairs.

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