CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

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3.4.4 Details of books and chapters in edited volumes / books per teacher during the Academic Year 2022-23

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Gas Leakage Detection System Using IoT And cloud Technology : A Review

V Praveen Sharma[1*], *Dr Raman* Dugyala[2], *Dr V* Padmavathi[3], *Vijendar Reddy* Gurram[4]

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Abstract. In industries and other locations gas leakage causes number of negative health effects .so an early detection of gas leakage and alertness will reduce the damage and save human life's. Gas leakage techniques, trends and sensors are constantly evolving, and it is important for developers and researchers to stay up-to-date on the latest advancements. This paper conducts a systematic literature review on current state of gas leakage detection using Internet of Things (IOT) and Cloud technology. It explores the various sensor-based and non-sensor based IOT systems available for gas leakage detection, and their relative advantages and disadvantages. Additionally, this review summarizes current trends and challenges in the field of gas leakage detection, and discusses future research directions for improving the reliability and accuracy of these systems. This literature review highlights the need for more efficient, cost effective, and scalable IOT-based solutions for gas leakage detection.

Keywords: IoT , MQ Sensor and Arduino.

1.1 Introduction

A collection of physical objects or things that are part of a network and have sensors, software, and other technologies built into them so they can connect to and share data with other systems and gadgets.These gadgets range from basic home furnishings to sophisticated industrial machines. Healthcare, agriculture, traffic monitoring, safety management, and environmental monitoring are just a few of the areas where IoT has become more significant. Due to the world's growing population, IoT applications like IoT

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IoT Based Gas Leakage detection System Using GPS

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Abstract. Gas leaks are a significant problem since they may have disastrous effects on infrastructure, human health, and greenhouse gas emissions, among other things. A method for early detection and alerting of gas leaks is required to reduce these dangers. In this project, we suggest a low-cost and efficient cloud-based Internet of Things (IoT) gas leak detection system for usage in residential, commercial, and industrial contexts. An Arduino Uno microcontroller, a Wi-Fi module, and a MQ 2 gas sensor make up the system. The sensor notifies the microcontroller when gas is detected, and the microcontroller analyses the information before sending it to the cloud through the IoT module. The cloud platform offers a user-friendly interface for managing and visualising data on gas leaks, and it also notifies customers through email and SMS. The system comes with a GPS module and a smoke detector for real-time position tracking and fire detection. The smoke detector detects smoke and sounds an alert, while the GPS module monitors the system's location. These qualities enable the system to effectively reduce the dangers of gas leaks and fires while enhancing environmental safety.
Keywords: Arduino Uno , MQ Sensor , ESP Module

1 Introduction

By enabling common things to connect to other systems and devices and share data through sensors, software, and other technologies, the Internet of Things (IoT) has completely changed the way we live. IoT devices are widely employed in a variety of industries, including healthcare, agriculture, traffic monitoring, safety management, and environmental monitoring. These devices range from simple home goods to sophisticated industrial

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A Novel Approach for Gas Leakage detection using GPS

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Abstract—**Gas leaks pose a serious risk to public safety and the environment, endangering human health, destroying infrastructure, and increasing greenhouse gas emissions. In order to minimize the harm and protect human life, early gas leak monitoring and alertness systems are necessary. In this project, we propose an Internet of Things (IoT) and cloud-based gas leak detection system. The system's goal is to provide a low-cost and effective way to detect and notify users of gas leaks in residential, commercial, and industrial locations. The system is made up of a MQ 2 gas sensor, arduino uno microcontroller, and an wifi module. When a gas leakage is detected, the gas sensor detects it, and the microcontroller interprets the information before sending it to the cloud via the IoT module. The cloud platform offers a user-friendly interface for visualizing and managing data related to gas leaks, and it also notifies users of gas leaks via email and SMS. A GPS module and a smoke detector are integrated into the system, enabling real-time location monitoring and fire detection. The system's location is tracked by the GPS module, and the smoke detector detects smoke and sounds an alarm. This device offers an efficient way to reduce the dangers of gas leaks and fires while improving environmental safety.**

Index Terms— **IoT, MQ sensors, Arduino Uno, Cloud Technology.**

I. INTRODUCTION

A collection of real-world objects or things that can link to other systems and devices and share data through the use of sensors, software, and other technologies. These gadgets range from common domestic items to sophisticated industrial machines. In a variety of industries, such as healthcare, agriculture, traffic monitoring, safety management, and environmental monitoring, IoT has become more significant. Applications for the Internet of Things in agriculture deal with the increased demand for agricultural goods brought on by the world's growing population. But when young people relocate to major cities, the human resource essential for agricultural growth becomes unstable. Automating farming processes and supplying the growing population with food can be made possible by the Internet of Things and related technologies. It is important for managing safety protocols in the chemical industry, such as by checking gas levels and ordering an evacuation in the event of a gas leak, as well as for monitoring and tracking the effects of chemical production on the environment, such as by counting the amount of harmful substances released and keeping track of how waste is disposed.

Because the gas leakage detection system differs from other types of data sources, researchers run into a number of issues with the IoT. We believe that security is the most crucial issue that has to be handled for IoT, which is one of the major concerns. Your IoT programming is vulnerable to a number of problems due to the developers working on it lacking security competence [1]. This also leaves your devices open to unauthorized

A YCbCr Model Based Shadow Detection and Removal Approach On Camouflaged Images

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Abstract—A shadow in an image can disturb the actual outcome in computer vision and pattern recognition applications. The reason is that the shadow will act as an individual object resulting in the false interpretation and performance degradation of subsequent computer vision tasks. Here we propose a process to detect and remove shadows from an image using the YCbCr colour model. A small portion of the image is identified as a shadow area. The features at the pixel level and along the boundaries in the shadow area are learned. A method based on the locations of the border of the shadow is applied to remove the shadow. Experiments have been conducted on the benchmark camouflaged image dataset and the non-camouflaged image dataset to evaluate the approach. The methodology achieves promising performance in detecting and removing shadows from an image.

Index Terms—Camouflaged Images, Detection of shadow, Removal of shadow , YCbCr, LAB

I. INTRODUCTION

A shadow is formed in an image due to various obstructions. The shadow that resembles an object in shape and size behaves just like the object. Shadow detection and removal are prerequisites for many image processing and computer vision areas. This is because shadows can interfere with the process of image segmentation and disturb the overall work. Algorithms related to shadow operations can be classified depending on the process of detecting and then removing them. One way is to consider the ground truth of the shadow as a reference and then remove the shadow. Some algorithms utilized features of the image such as background pattern, foreground colour, texture, brightness, etc., for shadow detection. Recently, methods for removal and detection involve mainly machine learning techniques. In this regard, we have analyzed the problems related to shadows in camouflaged images where much focus has not been done. The main difficulty in implementing previous versions of shadow removal techniques in hidden images was associated with the complexity of textured backgrounds. The old versions have mostly assumed a well-defined difference between the background and the object. The main concern in Camouflaged Shadow Removal(CSR) is that camouflaged images have objects with the same texture as the background. There are colour models other than RGB(Red, Green, Blue) which can define an image. Considering a particular model

is necessary based on the application area that is worked upon. We have considered the YCbCr(Y-Brightness, Cb-Blue, Cr-Red) model, where the "Y" parameter gives the details of the brightness value of the pixels. The shadow area is identified by thresholding the "Y" parameter in the YCbCr colour model. This is because the RGB model will not consider the texture in images.

Relevant work has been done on shadow detection and removal through thresholding. Kuo et al. [1] proposed a method of thresholding the regions based on a single feature. CSR presents a shadow detection method based on controlling the image's brightness and creating a mask by applying thresholds on the "Y" value of the pixel. The shadow removal process involves enhancing the brightness of the shadow pixels. This work includes:

- In the process of detecting shadow, the shadows are lightened by simply tweaking the brightness parameter. But the problem arises when the background has a rough texture. So, for that, the thresholding is done, and subsequently, a mask is achieved, which covers only the shadow area.

- The shadow removal procedure is done by editing the pixel values of the shadow region. The execution time is considerably low. The important features of the image are completely intact.

Fig. 1 Shows the input and output image of our algorithm. We can see two different types of objects with shadows that are considered. The first object is in a camouflaged form where the background colour and texture match the animal's body features. The problem here is that in hidden images, background information is crucial. But from the picture, we can understand that some background portion includes shadow. The other object is non-camouflaged and can be identified easily because there is a clear distinction between the body features of the elephant and the background.
CSR works fine for both camouflaged and non-camouflaged images. The stages given in the figure indicate that the first shadow regions are identified and removed.

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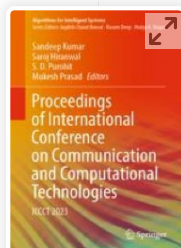
International Conference on Communication and Computational Technologies

ICCCT 2023: **Proceedings of International Conference on Communication and Computational Technologies** pp 499–507

Automated Pentesting and Threat Simulation

Tariq Ahmed, Hussain Aziz Ahmed & Sangeeta Gupta ✉

Conference paper | First Online: 01 September 2023

164 Accesses

Part of the Algorithms for Intelligent Systems book series (AIS)

Abstract

The first significant factor leading to a data breach is the intentional theft or sabotage by outside attackers, which costs $3.33 million on average. To protect systems and applications from such catastrophes, it is essential to find security flaws in advance. Employing ethically qualified hackers to

simulate threat actors for penetration tests is a frequent practice. This paper introduces a solution that combines the capabilities of different other tools to automate the complete pentesting process on a single platform due to the difficult nature of a pentest and the scarcity of trained professionals. Cybersecurity experts and other IT employees may do simple, automated, and hassle-free testing thanks to a user-friendly GUI. The web application interface of the tool, which is housed in the cloud, enables users to automate all kinds of scans, evaluations, and exploitations. It connects to the user's network via a node in the same network. In terms of automating the aforementioned pentesting process-venator, the suggested approach is novel.

Keywords

Automation   **Exploitation**

Penetration testing   **Threat simulation**

Vulnerability assessment

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International Conference on Artificial Intelligence and Data Science

ICAIDS 2021: **Artificial Intelligence and Data Science** pp 41–51

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A Systematic Review on Autonomous Vehicle: Traffic Sign Detection and Drowsiness Detection

Panna Lal Boda & Y. Ramadevi ✉

Conference paper │ First Online: 14 December 2022

319 Accesses

Part of the Communications in Computer and Information Science book series (CCIS,volume 1673)

Abstract

The automatic detection of traffic signs is necessary for assisted driving, autonomous driving, and driving safety. Traffic sign play a significant task for advanced driver assistance systems (ADAS) also for autonomous driving vehicles and also driver drowsiness detection are an important part. Due to

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fatigue and drowsiness of the drivers, each day more number of fatalities and deaths are massively increases. In order to avoid these problems, developed a traffic signs detection and drowsiness detection based on machine learning and deep learning techniques. Histogram of Oriented Gradients (HOG), Adaptive Momentum Estimation (ADAM) optimizer features, Random Forest (RF), Region-based Convolutional Neural Network (R-CNN), Long Short Term Memory (LSTM), and Support Vector Machine (SVM) method are used. German Traffic Sign Detection Benchmarks (GTSDB) dataset is used for classification and detection and it consist of 164 classes grouped into 8 categories. The proposed methods achieve the better results in conditions of accuracy comparable performance with the state of the art.

Keywords

Autonomous vehicle

Convolutional Neural Network

Drowsiness detection   **Deep Learning**

Traffic sign detection

Assistive System for the Visually Impaired using Multiple Cameras and Sensors

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Abstract—**On a global scale, at least 2.2 billion people are affected by a near or distance vision impairment. Vision is an essential aspect of human life, and vision loss is a problem many unfortunate people experience. Many blind people rely on white cane sticks and guide dogs for navigation, but they come with their own set of drawbacks. Assistive technologies are those utilities that aid visually impaired people in carrying out some specific tasks. This paper presents a novel assistive device that overcomes the issue of low visual coverage of the surroundings by using multiple cameras. The blind user can wear the cameras in the front, right, back, and left directions surrounding the neck, getting wider visual coverage. A raspberry pi microcomputer captures images from the cameras and uses them to find objects and faces without using the internet. The microcomputer provides voice feedback on the detections and the camera direction through earphones. An Arduino microcontroller connected to an ultrasonic sensor senses the obstacles and alerts the user with a vibration motor. A smartphone can connect to these Arduino and Raspberry pi modules via Bluetooth, and the user can send commands with the mobile application by touching or by voice. The system could get a broad picture of the surroundings and provide output in a reasonable amount of time.**

Keywords—vision impairment, assistive technologies, cameras, ultrasonic sensor, voice feedback

I. Introduction

At least 2.2 billion people globally have a near or distance vision impairment. The most common reasons for sight impairment and blindness are uncorrected refractive errors (URE), cataracts, age-related macular degeneration, glaucoma, and diabetic retinopathy, among others, where most people are above 50 years of age. However, vision defects can impact individuals of all ages. [1] Vision is a crucial human ability that helps them observe and understand their surroundings. However, some unfortunate people cannot see the world around them for many reasons. This inability to see the world through eyes is called blindness or vision impairment. People face many issues in their daily life due to a lack of vision. They find trouble doing everyday tasks such as avoiding obstacles, finding objects, and recognizing people, among many others. Many of them refuse to leave their homes without human aid and lack the confidence to do so. Visually impaired people rely on white cane sticks[2], guide dogs[3], or other humans for assistance. Nevertheless, they are not the most efficient means of avoiding obstacles and commuting, as they are prone to error and are limited in terms of features.

Assistive technology for the blind refers to technical aids that assist the blind in doing their everyday chores. As they depend on technology, they are less prone to error. Assistive technologies must be reliable and safe and not cause an accident. Such utilities must be comfortable and compact to wear and use. They should also have good coverage of the surroundings, function accurately, and operate in indoor and outdoor environments. More importantly, the blind person should put the least effort into controlling the device and comprehending the input it provides. These assistive devices use various technologies, sensors for sensing the environment and actuators for providing feedback. They should be cost-effective, accessible, and should have good real-time performance. These devices promote blind independence and improve their confidence to go outdoors. Many available solutions for visually impaired people are costly and not practically affordable. With the advancements in technology, hardware is getting cheaper and more efficient. In the present day, there are good prospects for developing user-friendly and cost-effective assistive devices. A great deal of research went into developing assistive technologies for the blind. The necessity for assistive technology to aid the blind is more prevalent than ever, especially in the COVID situation, where individuals may not be available to assist the blind.

This paper presents a novel, cost-effective system capturing images in various directions around the user to get comprehensive information about the surroundings and using them as input for computer vision tasks. Our solution assists visually impaired people in some of their daily activities like detecting objects and faces and avoiding obstacles. A sensor senses the obstacles ahead of the user, and computer vision techniques perform tasks like object and face detection. Computer vision is a mix of image processing and deep learning techniques dealing with the ability to obtain an understanding of images. It can be helpful to automate visual tasks that humans can do and acts as a substitute for those without vision. We developed the system using low-cost computing devices, sensors, and electronic components.

II. Literature survey

There are numerous methods for supporting the visually handicapped that use various technologies, sensors, and platforms. This section discusses various assistive technologies in the present era along with their features.

Dey *et al.* [4] presented an ultrasonic sensor-based smart-walking stick for detecting obstacles and alerting the user. It proposes a walking stick having three ultrasonic sensors to sense hurdles in the left, right, and front directions. A peripheral interface controller (PIC microcontroller) calculates the obstacle distance from the ultrasonic sensor. Whenever one of the sensors senses obstacles, a buzzer is triggered to alarm the blind person. The stick can detect obstacles in the range of 5-35 cm from the user. This solution has simple components and is inexpensive to build. It can

Virtual Machine allocation in multiple Data Centers using Throttled Load Balancing to improve the performance in Cloud

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Abstract—Today, Cloud Computing is a distributed system environment. These days the services are available pay as you go model. Cloud users are paying as per their services in the cloud environment. The services available to the Cloud users are Infrastructure as a service, platform as a service, software as a service and security as a service. Nowadays, most users are migrating to cloud platforms. In Covid - 19 pandemic situation, most large and small scale organizations operating their business using cloud platforms. On the other end due to industrial automation, the companies switched their operations to a cloud environments. Due to the rapid business migration, the demand for cloud computing increased. With the increase of demand in the cloud, the service providers are satisfied. On the other end, a challenging issue is resource allocation. The best resource allocation strategy will provide quick services to the cloud users and minimum cost to the cloud providers. In this paper, we will discuss , resource allocation procedure, the throttled load balancing algorithm and the results are compared with other resource optimization techniques.

Index Terms—Cloud Computing, Cloud Analyst, Virtual Machines, Data Center, Load Balancing

I. Introduction

Nowadays, Cloud computing is one of the most recent moving advances. It has a property simple to utilize and cost improvement administrations. It has such countless qualities out of which dependability, virtualization, performing multiple tasks, framework cost enhancement and the assistance of referenced highlights. Cloud computing is the stepping innovation. Today Cloud computing is utilized by many numerous startups. Business visionaries are saving their expense, time and working space by utilizing PCs to associate the cloud benefits as opposed to buying the Foundation. Cloud computing in short, the services are available pay as you go model. Due to this, so many short-time requirement users are using Cloud computing services.

There are many MNC's providing cloud services such as Amazon web services, Microsoft etc. [1]. The Cloud services are Infrastructure as a service(Iaas), platform as a service(Paas), Software as a service(Saas). Here, AWS EC2 instances are an example of Infrastructure as a service. Mi-

crosoft Azure is an example of a platform as a service; Google apps are examples of Software as a service.

Because of user-friendly, quickly to up the services and ease of doing business model, cloud services are used by many users. This increased their dynamic demand in cloud computing. Due to this, Load balancing came into the picture in Data centres. Before applying any algorithm in Data centre, for resource allocation, we need to know about the performance of the algorithm. For this reason, we are working on different algorithms. In this paper, we compare the results using Cloud Analyst Simulator.

II. Load Balancing Algorithms

A. Round Robin Load Balancing Algorithm

Round Robin is the most straight forward algorithm that uses the concept of quantum time. In Round Robin, each virtual machine will get quantum time. Once quantum time completes, the turn will get another virtual machine. If the quantum time is very large, then the round-robin algorithm acts as an First come First serve.
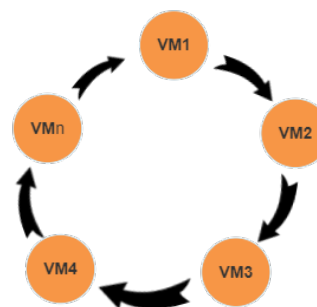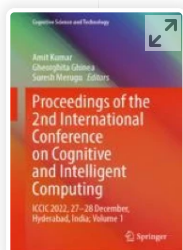

Fig. 1. RoundRobin Load balancing

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International Conference on Information and Management Engineering

ICCIC 2022: **Proceedings of the 2nd International Conference on Cognitive and Intelligent Computing** pp 197–203

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Crop Disease Detection Using NLP and Deep Learning

Talla Prashanthi ✉, Tumma Susmitha & Rupesh Kumar Mishra

Conference paper │ First Online: 27 September 2023

133 Accesses

Part of the Cognitive Science and Technology book series (CSAT)

Abstract

Nowadays, we have seen in our state, country, and others places that lot of crops are affecting from different diseases from different insects. So we have planned to develop a system for ranking of those regions which is basically infected with several diseases and which places infected more in

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comparisons with other regions. This work presents the first step toward a fully built, semantically enhanced decision support system for IPM. The ultimate objective is to construct a method to aid farmers in making decisions regarding the prevention of illnesses and pests as well as to create a comprehensive agriculture expertise compiled by collecting data from several different sources. With the help of NLP, sentiment analysis of the data is known, and when the farmers give text data of the symptoms as input, the disease name is generated using approaches for machine learning.

Keywords

NLP **BERT** **NER** **ICT** **SVM** **LSTM**

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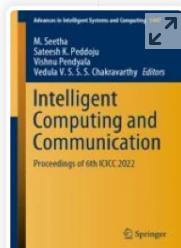
International Conference on Intelligent Computing and Communication

ICICC 2022: **Intelligent Computing and Communication** pp 199–206

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Quality-Produced Agricultural Crop Price Prediction Using Machine Learning

Tumma Susmitha ✉, Talla Prashanthi & Rupesh Kumar Mishra

Conference paper | First Online: 20 September 2023

80 Accesses

Abstract

Agriculture is India's backbone. It is a key sector of the Indian economy, contributing roughly 17% of the country's overall GDP and employing over 60% of the population. We can use technology to improve product production in a variety of ways,

but in the end, a farmer can only benefit if he makes money selling his crops. The Indian government has passed three legislations to promote agricultural produce trade throughout the country. Today, however, we can see farmers across the country battling for their rights against these rules. Farmers fear that they will be used as puppets by major retailers and that their products would be sold at a reduced price. After analysing the situation, we came up with the idea of developing an agricultural produce application that predicts the price of agricultural produce based on the quantity produced and previous years' sales rates, allows farmers to interact directly with retailers, and allows for product review and crop yielding rate prediction.

Keywords

KNN   **GPS navigation**   **Decision tree**

Regression algorithm

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International Joint Conference on Advances in Computational Intelligence

IJCACI 2022: **Proceedings of International Joint Conference on Advances in Computational Intelligence** pp 407–417

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Learning Automata Based Harmony Search Routing Algorithm for Wireless Sensor Networks

Karthik Karmakonda ✉, M. Swamy Das & Bandi Rambabu

Conference paper | First Online: 16 June 2023

96 Accesses

Part of the Algorithms for Intelligent Systems book series (AIS)

Abstract

Wireless sensor network and IoT Networks are outstanding emerging technologies many applications of industry automation. End nodes are resource constraint in terms of such as limited energy, limited transmission energy, limited computing ca- pability, so design of routing protocol is NP hard. In the literature nature inspired meta-heuristics algorithms are used to optimize the resource utilization. In this paper a Meta Heuristic algorithm Harmony Search Algorithm(HSA) based energy efficient routing scheme for finding better route from each sensor node to Base station. Learning Automate is used in routing process to find better neighborhood during establishment of Forwarding paths. Fitness of each harmony is evaluated based on the parameters residual energy, hop count in the path. The simulation results demonstrated in terms of number of data packets, residual energy, energy consumption's and network lifetime and also it shows that LAHSR outperformed both IHSBEER and EEHSBR algorithms.

Keywords

Wireless sensor networks   **Harmony search**   **Learning automata**

Energy efficiency   **Lifetime**

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Storage Virtualization Mechanism for Securing Electronic Health Records in Cloud

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Abstract—In the present situation, storing digital health records in the cloud for the immediate usage of patients and treatment providers is the most convenient and economical way for patients. Cloud based Electronic Health Records contain information about the patients and also provide updates to the treatment providers. From the treatment providers' perspective, it is easy for them to see the previous health records of their patients. As a result, the duplication of health records is eliminated. However, the major issue in this system is storing health records and protecting the privacy of patient's details in the cloud. Currently, there are many research scholars who are working constantly to maintain and update the existing electronic health records in the cloud. The aim of this paper is to create virtual storage to secure electronic health records and to provide privacy and backups to customers.

Index Terms—Cloud computing, Storage virtualization, Electronic Health Records, Privacy.

I. INTRODUCTION

The amount of digital data generated by pharmaceutical companies, life sciences, hospitals, medical labs and insurance agencies is increasing and the healthcare sector is grappling with it. There is a lot of patient information and hundreds of disconnected points across the healthcare industry. Industries are every time striving to push their boundaries further to leverage the current technologies that could help them get an edge over others. There was a paradigm shift in healthcare operations during the covid pandemic. Cloud providers have focused on how this information technology has benefited the healthcare industry. The advantages of healthcare in cloud computing are slowly being utilized by the healthcare sector.

Here are some benefits of Cloud Adaptation for the healthcare industry

- Minimize the operational cost
- Maximize the security
- Adaptation to evolving IT infrastructure

As digital transformations started to scale up, healthcare organizations across the world have started cloud based services.

II. CLOUD COMPUTING - AN OPPORTUNITY FOR HEALTHCARE

With the elastic nature of the cloud, healthcare industries may build dynamic infrastructures that increase the efficiency of operations and accelerate the use of IT resources. Cloud computing services are useful for organizations looking for proactive measures to satisfy healthcare industry challenges. Healthcare professionals from all around the world may virtually connect with cloud solutions to communicate, react fast, enable remote care, and share their best practices as shown in figure 1.
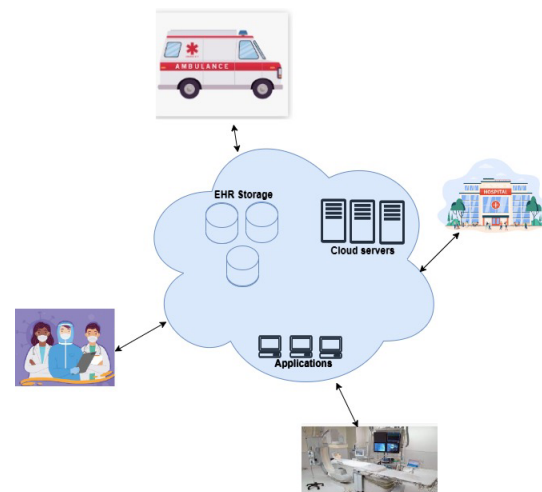

Fig. 1. Electronic Health Records in cloud

Cloud services are frequently limited to email applications and collaboration online interaction like google meetings. Present scenario the movement to clinical reports exchange is starting to grow in a phased manner.

A. Current situation of Healthcare sector

The healthcare sector has not done its best for improving the delivery of services to patients. Even today, hospitals still rely on paper-based medical reports and handwritten prescriptions to communicate and make proper decisions. Digital information is siloed between health departments and applications, making easy access to patient records difficult. Lack of access costs the healthcare sector thousands of dollars every year for duplication. Sharing of patient data among labs, departments and even to patients by email or phone is a rare
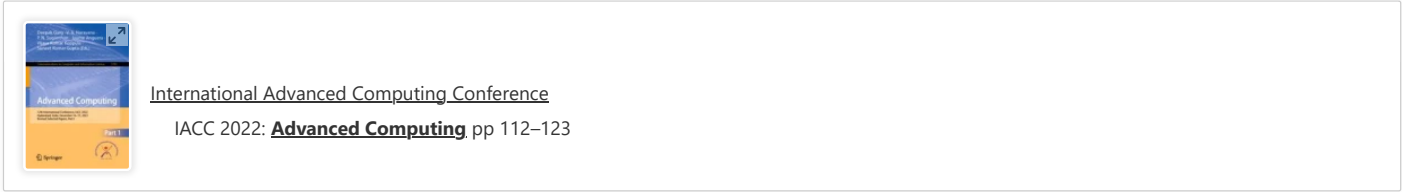
International Advanced Computing Conference

IACC 2022: **Advanced Computing**, pp 112–123

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Hashtag2vec: Ranking of Disaster Related Tourism Spot's Hashtag on Twitter Data

Rupesh Kumar Mishra, Talla Prashanthi, T. Susmitha, K. Arjun & Shree Harsh Attri ✉

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Abstract

The ever expanding disasters based tourism spots industry is drawing attention of folks through social networking sites, as people are travelling to corners of the world and encouraging many to fulfill their dreams. Our work is based upon retrieving the people experiences shared on twitter's hash tag and automatically generating the rank of disasters related tourist spots in search which are safe, easily approachable and economical as per the tourist reviews. In this paper, our work is divided into data collection and filtration and then using deep learning approaches, LSTM such as word2vec, tweet2vec, hash tag2vec and NCA for feature extraction and Long Short Term Memory techniques for classification we have applied to generate results. (1) Collections of disasters based tourist spot related hashtags datasets in english and non-english language both. After that, manually classify the datasets between English and non-english languages. (2) Hash2vec has been used for making labeled datasets called Semantic-tagged tokens and (3) Apply Long Short Term Memory approach with hash2vec model have been used for representing the document and predict the rank of disasters based tourism spots hash tag. This tool will help people and travel companies to classify tourist places as per their needs and it will also help to retrieve the world's top cities chart depending on the online ratings and reviews..

Keywords

Tweet2vec   hashtag2vec   LSTM   features extraction   Polarity score

hashtag embedding

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NoSQL Cloud based Bigdata technologies for efficient performance evaluation in the modern era

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Abstract— **Modern society's most recent technology breakthroughs have given rise to innovations that, when handled effectively, can result in value-added outcomes or, when handled incorrectly, can cause disruptions. One such technology is the plethora of NoSQL cloud databases that have developed. There isn't a single store that combines all of these properties, despite the fact that these provide a wide range of features like consistency, availability, fault-tolerance, scalability, and security. This aspect gains wide support if integrated with various learning platforms to yield an added outcome. Regardless of the dataset, applying pre-processing techniques and identifying data splits is a necessary step to do in order to infer better outcomes. Towards this end, an efficient NoSQL cloud datstore based analysis is presented to showcase the significance of NoSQL over traditional relational databases to overcome bigdata analysis based difficulties. Based on the type of data to be examined and the evaluation of the results, an appropriate cloud datastore is chosen.**

Keywords— ***bigdata, nosql, cloud, mysql, relational, mongoDB, cassandra, load, retrieve***

I INTRODUCTION

In the modern world, having solid coding skills is essential for handling the effective processing of huge amounts of data. For a developer or learner who wants to inherit the coding domain as their primary duty, a set of open-source options makes this task much simpler. This work was made simple for any community by the availability of a large selection of APIs (Application Programmable Interfaces), allowing users to concentrate on bigdata-based architectural developments. Additionally, serverless architectures are used to disperse the monitoring of such massive amounts of data. The cloud is crucial in this regard since it can handle the processing and storage needs of bigdata-based applications. Additionally, different applications and environments provide different types of results. (Christidis & Moschoyiannis, 2020).

The growth of voluminous data is trending in the recent days. This increase is due to the adoption of social networking and e-commerce media by the users hailing from a wide set of localities. This results in dealing with the concerns to ensure safe and secure data access. If the data is digitally signed by a single user, the document can be propagated across the network and the participating entities can verify the signature using an public or open key.

However, the destination for whom the document is intended to, will only be able to access the content in the document. It is also essential to strengthen the security, if there are numerous anonymous parties involved to carry out the transactions across the network. Towards this end, the digital signatures of multiple users are integrated thereby making it difficult to the intruder to gain access to the non-sharable data (Huynh et al., 2021).

The influence of internet inputs on individuals today is so great that many consumers decide whether to buy a certain product or not based solely on online reviews, often without even contacting those who will really use it. Due to poor or unproven long-lasting quality of the thing they acquired online, this can occasionally put them at a loss. Electronic products in particular run the risk of becoming defective if they are chosen without cross-verification. In order to solve the aforementioned challenges, the authors in (Awajan et al., 2021) suggested an effective decision-making mining model. The study is strengthened using multiple metrics, including the cosine similarity measure, Manhattan distance, and Euclidean distance. However, there is no illustration of processing several tweets using the aforementioned metrics.

The education sector has had a significant number of negative effects as a result of this unexpected pandemic. First off, using online technologies to offer sessions or lectures has been shown to be risky because everything is saved on servers owned by other parties. The second issue is the general lack of focus among students of all ages, from elementary and secondary school students to undergraduates. The third is the increased strain on the teaching community brought on by online meetings, the administration of tests, etc. Due to all these negative consequences, people began to think critically and develop research-based remedies and incorporating other brainstorming exercises in between sessions. (Munshi et al., 2021).

The creation and development of proper tools is another challenging area to concentrate on when dealing with the numerous data kinds found in the real world. It is crucial to consider the system compatibility, language, and API availability as this architecture is implemented. This also affects the area chosen to conduct the analysis in order to go forward with the decision-making process (Moin, 2021). Additionally, the dataset to be investigated and the related technologies can be identified based on the architecture that

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A Proficient Vertical Handover Decision Making Algorithm in Internet of Vehicles with 5G

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Abstract—**As known, usage of mobile devices are enormously increasing day by day and these devices are being used in different applications where the user satisfaction, seamless connectivity, Quality of Service(QoS) and service among heterogeneous networks are very important features. These mobile devices have been introduced to include features such as advanced wireless technology support, seamless mobile networking, increased processing speed and improved multimedia services in recent days. These services allow the service provider to satisfy customers with enhanced service quality. Recently, the vehicle ecosystem emerged in the Internet of Vehicles (IoV); it involves the computational processing of moving vehicles to perform dynamic operations with wireless feature. To offer reliable services, Heterogeneous Wireless Networks (HWNs) such as 5th Generation (5G) cellular network is considered to permit users with global devices to access the required service at anyplace and anywhere.**

Keywords—*IoV, vertical handover, heterogeneous networks, 5G, QoS.*

I. INTRODUCTION

A heterogeneous network is one that employs a variety of access technologies. This is also used in wireless networks, such as a wireless network that delivers service over a wireless Local Area Network(LAN) while simultaneously being able to retain service while switching to a cellular network [2].

A handover is a telecommunication & mobile communications procedure during which a linked cellular call or data session is transferred from one person to another. Horizontal Handover: When a user transitions between two separate network access points of the same type, this is known as horizontal handover. When a user changes between two separate network access points of different kinds, this is known as vertical handover. Handover is also called handoff[4].

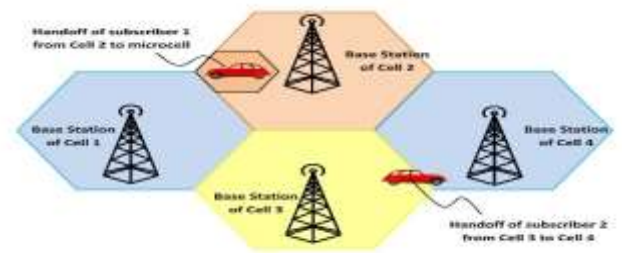The figure 1 shows the handover process.

Fig. 1. Handover process

1.1. **Horizontal Handover:** When a user transitions between two separate network access points of the same type, this is known as horizontal handover.

1.2. **Vertical Handover:** When a user changes between two different access points, this is known as a vertical handover [8],[21]

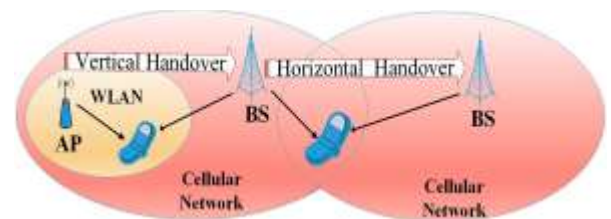The below figure 2 depicts the types of handover

Fig. 2. Handover Types

The figures figures 3(a) and 3(b)shows the present and future handover scenarios

An Efficient VHO Algorithm to Enhance QoS in Internet of Vehicles with the Integration of 5G

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Abstract—In a developing country such as India, the intellection of smart city and the boom for a wide range of vehicles, Internet of Vehicles (IoV) has gained a lot of consideration by furnishing numerous benefits, including traffic congestion control, smart parking, vehicle emergency and monitoring levels of pollution. Furthermore, IoV provides support for vehicles over internet aid communication. In order to have a better communication between Vehicle-to-Everything (V2X), an advanced network infrastructure is required. The currently available networks like 3rd generation (3G), 4th generation (4G) or long term evolution (LTE) are not adequate for these kinds of communications; There comes the 5th Generation (5G) cellular network into the picture. The 5G offers real-time crowd sourcing, higher data rates, low latency for transmission and sensing as a complementary base for information. In addition to the leading edge network infrastructure, the mobility of vehicles urges to have a perfect handover (HO) mechanism among heterogeneous networks. This paper discuss about the integration IoV with 5G and the importance of vertical handover (VHO) mechanism using an Artificial Intelligence algorithm and analyze its performance based on few of the parameters such as data transfer rate, transmission delay, mean throughput, packet delivery ratio (PDR) and Quality of Service (QoS).

Keywords— IoV, V2X, Smart City, 4G, 5G, LTE, Heterogeneous Network, Handover, VHO, PDR, QoS.

I. INTRODUCTION

A heterogeneous network is the one that applys a various kinds of access technologies. It is also used in wireless networks, such as a wireless network that provides service over a wireless Local Area Network (LAN) on the other hand, being able to preserve service while shifting to a cellular network [2].

A handover is a telecommunication & mobile communications course of action during which a associated cellular call or data session is switched from one person to another. Horizontal Handover: When a user switches between two individual network access points of the same type, then it is known as horizontal handover. When a user switches between two different network access points of distinct kinds, then it is known as vertical handover. Handover is also known as handoff. The process of handover is illustrated in Fig. 1.
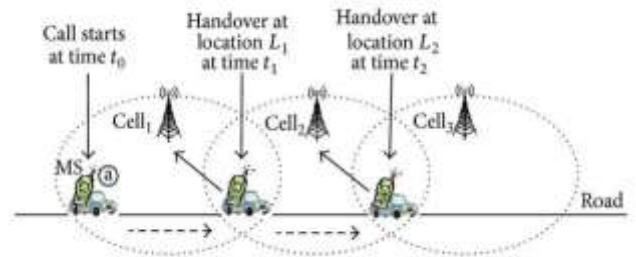

Fig. 1. Handover process

A. Horizontal Handover: When a user switches between two individual network access points of the same type, then it is known as horizontal handover.

B. Vertical Handover: When a user switches between two different network access points of distinct kinds, then it is known as vertical handover.

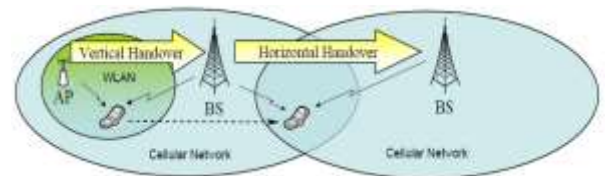Fig. 2 depicts the different types of handover mechanisms.

Fig. 2. Handover Types

Fig. 3 a), b) shows the present and future handover scenarios.

A Survey on MQTT Bridges, Challenges and its Solutions

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Abstract— **MQTT is an Internet of Things (IoT) protocol designed to enable machine-to-machine communication. MQTT's publish/subscribe message transport mechanism is extremely lightweight. This protocol is useful to establish remote communication when data transfer rates are limited. With these characteristics, it can be used in a variety of scenarios, from temporary to permanent contexts, making it ideal for machine-to-machine and IoT communications. This research study reviews the state-of-the-art MQTT bridges, message format, and configuration. Finally, the study concluded by stating the current challenges, solutions and future research directions.**

Keywords—Internet of Things, Message Queue Telemetry Transport, Broker, Topic, bridge, Software Defined Networking

I. INTRODUCTION

MQTT is the abbreviation for Message Queuing Telemetry Transport [1]. The publish/subscribe mechanism in which we may send and receive messages as clients. This facilitates interaction between a wide range of electronic gadgets. It is a basic communications protocol developed for devices with limited memory and bandwidth, making it an ideal choice for IoT based Applications.

Few other protocols match the MQTT's combination of flexibility and efficiency. The following are some of the characteristics of a MQTT:

a) Specifically, it is a protocol that allows machines to communicate with one another.

b) Intended for usage as a lightweight and straightforward messaging protocol, it relies on a publish/subscribe model for two-way data transmission between the client and server.

c) A simultaneous connection between client and server is not necessary.

d) Much to how WhatsApp and other messaging services expedite deliveries, so does this one speed up the transfer of data. It's a protocol for instantaneous communication.

e) Customers may choose from a curated list of topics and sign up for updates just on those that interest them.

Message Queue Telemetry Transport is a lightweight message communication protocol being used in the IoT devices. IoT [5] devices have less memory and processing speed, so they require lightweight protocols like MQTT. MQTT uses a middle where architecture called a broker. MQTT follows publish/subscribe communication model. MQTT broker creates topics. The clients who would like to receive messages, they need to subscribe to a particular topic. These clients are calling as subscribers. The clients who need to send the messages, they need to write on to a particular topic. These are calling publishers. Fig 1 explains the architecture of MQTT protocol. MQTT protocol is an asynchronous protocol, so publisher and subscriber need not be online at the same time.

Message queue telemetry transport provides reliable communication because it uses transmission control protocol (TCP) as communication protocol. MQTT supports three levels of quality of service (QoS) to transfer messages. They are QoS 0, QoS 1 and QoS 2. QoS 0 sends message only once. There is no guarantee that whether the message is received by destination or not. No acknowledgement shared between sender and receiver. QoS 0 does not allow for sending messages duplicate. QoS 1 send messages at least once. Sender will wait for acknowledgement from the receiver after sending messages, if no proper acknowledgement received form receiver, sends keep on sending messages until receives an acknowledgement. Once the acknowledgement received broker notifies the sender. QoS 2 send messages only once. It forwards the messages slowly as compared other QoS levels. QoS 2 receives acknowledgement in all the steps.
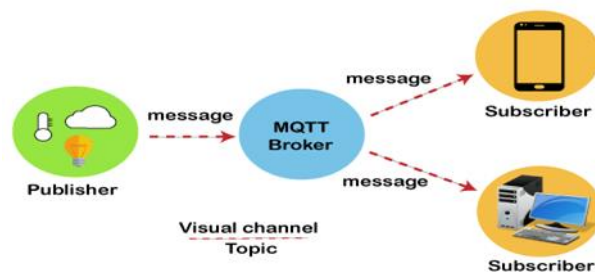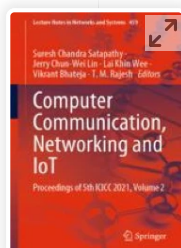

Fig 1. MQTT Architecture

Fig 2. Shows us the message format. Each command in MQTT[1] is accompanied by an acknowledgement in the form of a command acknowledgment, as per the protocol's

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Computer Communication, Networking and IoT pp 403–412

Efficient Dynamic Framework to Secure MQTT to Detect Distributed DoS Using Meta-Empirical Clustering

V. Thirupathi ✉ & K. Sagar

Abstract

The development of IoT plays a significant role for the development of new wireless communication. As Message Queuing Telemetry Transport (MQTT) with certain constraints helps to make IoT operations to complete based on Machine-to-Machine (M2M) communication. For MQTT, security

is a crucial factor when there is a communication establishment due to the increase in the usage of IoT devices and there is a need to secure the communication. There is a possibility of various attacks like Denial of Service (DoS) and Distributed Denial of Service (Distributed DoS) whenever IoT communication is open one, and there are several IoT applications like health monitoring, smart home, etc. while considering the attack of DoS and Distributed DoS, effective intrusion detection system (IDS) is needed by considering the IoT-based application. In this work, we have proposed the optimization mechanism based on meta-empirical clustering for Distributed DoS detection to mitigate the DoS and Distributed DoS attacks based on the attack request. The effective mechanism helps to secure the MQTT and detect the malicious behaviour of the nodes in the network. The performance analysis to be done as to show the proposed method gives more accuracy compared to existing ones such as MQTT security and CoAP and XMPP.

Keywords

MQTT   **IDS**   **DoS**   **DDoS**

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A Review on Deep Learning Approaches for Histopathology Breast Cancer Classification

Rathlavath Kalavathi ✉ & M. Swamy Das

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Abstract

Deep learning (DL) is the most rapidly expanding in the current scenario. For image analysis and categorization, deep neural networks (DNNs) are presently the most extensively utilized technology. DNN designs include GoogleNet, residual networks, and AlexNet, among others. Breast cancer is seen as a major problem that endangers the lives and health of women. Ultrasonography or MRI scanning methods are used to diagnose breast cancer disease. Imaging methods used for diagnosis include digital mammography, ultrasonography, magnetic resonance imaging, and infrared thermography. The primary objective is to investigate different deep learning algorithms for recognizing breast cancer-affected imageries. The best models provide accuracy for the 2, 4, and classifications on cancer datasets. No previous research is carried out for the current model investigation. Early detection and screening are critical for effective therapy. The following is a synopsis of recent progress in mammograms and identification, as well as a discussion of technological advancements. An effective test result should meet the following requirements: performance, sensitivity, specificity, precision, recall, and low cost. The experimental settings for every study on breast cancer histopathology images are thoroughly reviewed and deliberated in this article.

Keywords

Medical images   **Deep learning**   **Optimization**   **Breast cancer**   **Classification**

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ICCIC 2022: **Proceedings of the 2nd International Conference on Cognitive and Intelligent Computing** pp 685–690

A Systematic Review on Multiple Sclerosis

Kavita Goura ✉ & Anita Harsoor

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117 Accesses

Part of the Cognitive Science and Technology book series (CSAT)

Abstract

MS is a severe neurological disorder with varying impacts on each person. This autoimmune disease attacks myelin sheath of neurons in the central nervous system which includes brain and spinal cord. As a result, the neuron becomes inflamed or scarred making it difficult for the neuron to transmit information quickly and readily. The damaged and scarred tissue of a neuron is called as MS lesion. Although scientists do not yet fully understand the origin of MS, a mix of environmental and genetic variables is thought to be responsible. Amongst people suffering with MS, 85% suffer with relapsing–remitting MS and 10 to 15% suffer with progressive MS. Studies have revealed that Epstein-Barr virus (EBV) exposure raises the risk of RRMS. This review gives an indepth idea about MS. Presented are the topics of symptoms associated with MS, tools used to detect MS, commonly used algorithms for diagnosis and prediction of MS, prominent and recent approaches. About 2.5 million people have MS globally. Some of the most common misconceptions about the disease are that it's contagious (it's not), it's fatal (also untrue) and that MS affects mostly white people (the disease is just as prevalent amongst Black people). RRMS is three times more prevalent in women, whereas PPMS rate is alike in both men and women. One can visualise MS effectively by MRI. There are distinct patterns between lesions and healthy tissue. Outlining these patterns manually or automatically is called segmentation. Segmentation is crucial at every stage of MS, including during diagnosis, disease progression, and therapy effectiveness. Presently, there is no cure for MS. So retrieve and harvest of stem cells is done. Immunosuppression like chemotherapy and stem cell transplantation is done. MS is a complex and devastating disease that will take years to fully comprehend. A person will have a disorder related to the location of the scar or inflammation, such as tremor, dysarthria, ataxia, and cognitive problems if the scar is in the cerebellar area. As a result, each case is nearly unique.

Keywords

Relapsing–remitting MS (RRMS)   **Primary-progressive MS (PPMS)**

Magnetic resonance imaging (MRI)

International Conference on Information and Management Engineering

ICCIC 2022: **Proceedings of the 2nd International Conference on Cognitive and Intelligent Computing** pp 691–704

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Smart Health Monitoring System by Using Raspberry Pi

Kavita Goura ✉ & Ponnala Nikhil Reddy

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133 Accesses

Part of the Cognitive Science and Technology book series (CSAT)

Abstract

The development of healthcare is extremely crucial to our daily lives. Many people's lives are getting affected because the patients are not getting proper treatment. And sometimes, it becomes difficult for doctors to frequently check the patient's conditions. Here, monitoring of patient live status and health conditions from anywhere in the world is presented. With this, doctor will have complete update about patient's health conditions all the time. This is achieved by monitoring important health parameters like temperature, oxygen level etc. For measuring vital parameters sensors like ECG sensor, a MAX30100 pulse oximetry sensor are used. These input sensors are attached to a Raspberry Pi 4 so that the vital data can be measured. When these values, cross certain threshold, it is reported to nearby doctor or caregiver who is taking care of that patient. Reporting is done by sending alert message using the GSM module which facilitates communication between the doctor and patients in the event of an emergency. The implemented modules ensure that patients receives the opportunity for 24/7 surveillance of their health. In the event of emergency doctor can receive warning message such as an SMS alert. This platform is very beneficial for patients who require ongoing home care or regular checkups. The main aim of the system is to prevent delays in the arrival of patient's medical information to the healthcare providers, particularly in accidental conditions and emergency situations. After connecting Internet to the Raspberry Pi 4 Model B acts as a server, it automatically sends/receives data to the web server.

Keywords

Raspberry Pi 4   **ECG sensor**   **DHT-11**   **Pulse oximetry sensor (SP02)**

Web camera module   **GPRS/GSM module**   **GPS sensor**

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New Intrusion Detection System Based on Neural Networks and Clustering

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Abstract. Efficiency of Intrusion detection systems-IDS are evaluated using parameters like completeness, performance and accuracy. The first important parameter is the completeness, which occurs when the detection of attack fails. This is the most difficult parameter to evaluate compared to the other two parameters. The second one is performance, which indicates the audit events process. When the IDS doesn't work properly or works poorly, the real time detection becomes impossible. Legitimate actions are flagged as anomalous which is termed as inaccuracy. This part needs attention to address the inaccuracies. Optimal solutions must take the inaccuracies into consideration for accuracy, thereby efficiency of IDS. There are different trends in IDS. Some of them are discussed below. Behavior and knowledge-based IDS: Misuse detection, appearance-based detection, behavior detection and anomaly detection etc. There are numerous stability and security issues as a result of the Internet's and computer networks' rapid proliferation. The present study reports the case study of image processing in a fruit grading plant with data safety over cloud with Original Equipment Manufacturer (OEM). How Artificial Neural Networks (ANN) architecture can help is discussed and recommendations are made for impending improvement.

1. Introduction

As a result of the sharp rise in network attacks over the past few years, researchers' interest in network intrusion detection has risen. Private and governmental organisations rely more and more on their computer networks, thus protecting them from assault is a critical matter. The most important instruments for ensuring safety in computer and network systems are intrusion detection systems. because a single computer network intrusion might result in a significant loss or make the network's consistency unstable. As a result, precise network

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A Comprehensive Survey on Face Quality Detection in a Video Frame

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Abstract. The correctness of the generated face data, which is impacted by a number of variables, significantly affects how well face analysis and recognition systems perform. By automatically analysing the face data quality in terms of its biometric value, it might be able to identify low-quality data and take the necessary action. With a focus on visible wavelength face image input, this study summarises the body of research on the evaluation of face picture quality. The use of DL-based methods is unquestionably expanding, and there are major conceptual differences between them and current approaches, such as the inclusion of quality assessment in face recognition models. In addition to image selection, which is the topic of this article, face picture quality assessment can be used in a wide range of application scenarios. The requirement for comparative algorithm assessments and the difficulty of creating Deep Learning (DL) techniques that are intelligible in addition to providing accurate utility estimates are just a few of the issues and topics that remain unanswered. For each frame, the suggested method is compared to traditional facial feature extraction, and for a collection of video frames, it is compared to well-known clustering algorithms.

Keywords: Face quality, video frame, Face detection, Face recognition

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An Ensemble Learning Approach For Task Failure Prediction In Cloud Data Centers

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Abstract. Due to cloud computing's extensive use and diverse nature, they experience failures in terms of software, service, and platform, which lead to the failure of task execution, resource waste and performance deterioration. Most studies focused on failure prediction resulted in lower prediction accuracies due to limited attributes and a single prediction model. Hence, in this paper, an efficient ensemble model for task failure prediction is put forth.. Initially, the input dataset is collected and pre-processed. In pre-processing, the dataset is cleaned up of all null values. Then, the dimensionality of the pre-processed dataset is reduced by using the PCA algorithm. Thus, the reconstructed dataset is split into training and testing sets to train failure prediction models. The proposed model employs an ensemble learning approach based on different ML and DL algorithms. Then, a comparative study is performed, and the results show that task failure in the cloud system can be effectively predicted using the proposed ensemble method.

1. Introduction

Cloud data centres are becoming increasingly popular due to the wide range of facilities and their adaptability in different domains, such as e-commerce, nuclear science, scientific computing, and healthcare [7].With diverse resource demands and performance objectives, cloud data centers act as a home to a variety of applications. This oversubscription in the resources of cloud data centers overextended the resources, such as CPU and bandwidth, and is shared across many tenants [2]

But the main issues with cloud data centres are resource and task failures, which result in poor customer service quality [11]. Task failure, which can be described as the point at

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Weapon Detection in Surveillance Videos Using YOLOV8 and PELSF-DCNN

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Abstract. Weapon detection (WD) provides early detection of potentially violent situations. Despite deep learning (DL) algorithms and sophisticated closed-circuit television (CCTVs), detecting weapons is still a difficult task. So, this paper proposes a WD model using PELSF-DCNN. Initially, the input video is converted into frames and pre-processed. The objects in the pre-processed frames are detected using the YOLOv8. In meantime, motion estimation is done using the DS algorithm in the pre-processed images to cover all the information. Then, the detected weapons undergo a sliding window process by considering the motion estimated frames. The silhouette score is calculated for detected humans and other objects. Now, the features are extracted and the important features are selected using the CSBO algorithm. The selected features and the output of YOLOv8 are given to the PELSF-DCNN classifier. Finally, the confidence score is calculated for the frame to define the number of weapons. In an experimental evaluation, the proposed method is found to be more efficient than the existing methods.

1. Introduction

Due to the rise in crime during crowded events, security is always a top concern in all fields. The installation of video surveillance systems can recognise and analyse the scene due to the increasing demand for safety protection [9]. A low-cost way to monitor vast regions without obstructing the movement of people is through video surveillance [10]. They are developed as tools in public administration-related activities to maintain public order, to regulate unpleasant and anti-social behaviour [11]. Dangerous weapons are being used in criminal activities and terrorism. Therefore, the implementation of WD in a surveillance camera can detect weapons from the video feed [12].

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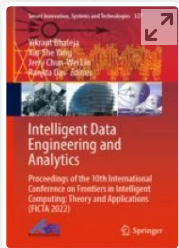
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Lightweight Privacy Preserving Framework at Edge Layer in IoT

Kavita Agrawal, Suresh Chittineni ✉, P. V. G. D. Prasad Reddy, K. Subhadra & Elizabeth D. Diaz

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Abstract

The Internet of Things is helping us to make our lives comfortable. IoT devices used here are resource-constrained in terms of memory and CPU as well as they lack basic security design. When everyone is using IoT, there are high chances of their personal data getting exposed to the outside

world. For real-time application, data need to be processed at the edge layer directly instead of doing the entire processing and analysis at cloud. Privacy preserving at the edge layer in the Internet of Things is a challenging task. We proposed a lightweight privacy preserving framework that uses the concept of blockchain, zero knowledge proof algorithm, principal component analysis, and digital signatures. Here for the mining process in blockchain, Trust concept is being used instead of Proof of Work (POW) and Proof of Stake (POS) as it consumes fewer resources and our edge layer is resource constrained. This could be a feasible solution and can be deployed at the edge layer in the Internet of Things for preserving privacy.

Keywords

PCA   **Zero knowledge proof**   **Trust**

Blockchain   **Edge computing**   **POW**   **POS**

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Programming assignment grading through control statement and program features

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Abstract—Recently, automatic programming assessment has grown in importance as a technique for supporting lecturers and instructors of programming courses in automatically marking and grading students programming exercises and giving helpful feedback on the students programming answers.In this paper, we propose a method for evaluating C programs.Static and dynamic analysis methods are two distinct strategies that are distinguished in this context. In contrast to dynamic analysis, which must assess an executable program, static analysis can analyse a program even if it is not totally executed. The proposed approach is based on the static analysis of programs.This paper introduces two metrics to grade student programs by using (i) Control Statement Features (ii) Program Features like different types of statements, operators and operands.It consists of comparing the student program with the program offered by the evaluator through feature metrics.Dealing with the number of solutions that are available for the same programming problem presents a significant difficulty in this situation.To address this flaw, we suggest a novel similarity metric that contrasts two programs based on how they execute semantically.In the area of automated program evaluation, the experiments findings point to a promising realisation. They further prove that the proposed method guarantees a close approximation to the human program evaluation.

Index Terms—automatic programming assessment,static analysis,control statement , program features

I. INTRODUCTION

Computer programming classes are renowned for being very practical and aimed at improving students' understanding of the fundamentals of programming. In order for students to successfully practice all the principles and concepts of programming during the learning process, several programming exercises are provided to them as hands-on or take-home projects. The practice of grading programming exercises results in a heavy effort for lecturers or instructors due to growing class sizes, especially if it must be done manually[5, 6]. Manual evaluation is said to make it more difficult to ensure the consistency and accuracy of assessment outcomes, as well as to prevent unintentional biases and a wide range of marking criteria. Manual evaluation is said to make it more difficult to ensure the consistency and accuracy of assessment outcomes, as well as to prevent unintentional biases and a wide range of marking criteria. As a result, automatic evaluation of programming exercises has emerged as a crucial technique for marking students' programming assignments and providing feedback

on their solutions. Additionally, it can enhance the reliability, precision, and effectiveness of marking assessment items[7, 9]. As a result, a device called an automatic assessment system is created. As we all know, assessment of of programs can be done in two ways: Static program analysis could be a technique of examining source code before a program is run, while Dynamic program analysis is a method of testing and evaluating a program while it is running.

A. Static program analysis:

Static program analysis has recently emerged as an effective method for program assessment.Another common method for automatically grading programs involves comparing the abstract representations of a student's program and the representations of right solutions to the problem (such as Control Flow Graphs and Program Dependence Graphs)[3, 8, 10, 11, 12]. There are two well-liked approaches: theorem proving and model checking[1].

B. Dynamic Program Analysis:

At the moment, evaluating how many test cases a program passes is the method most frequently used for automatic program evaluation. Unfortunately, there are numerous issues with this strategy. High test-case pass rates don't necessarily mean that a program is efficient or that it was developed correctly[2, 13]. Dynamic analysis evaluates a program by running it using test data that are either manually or automatically created. To put it another way, dynamic program analysis is the act of analysing computer software by running programs created using that software system on a physical or virtual processor.

We concentrate on finding similarity between student program and model program.Our main focus is identifying similarities between the student program and the model program. There are two different kinds of program level similarities, according to the research.

1) Textual similarity: When the source code of two programs are equal.
2) Similarity at the semantic level or function level: When two programmes execute the same task. The following

Accurate Gradient Selective Based Histogram Bin Shifting for Reversible Data Hiding

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Abstract—**A good prediction Error Expansion (PEE) based reversible data hiding method demands an effective pixel prediction strategy. There are numerous pixel prediction techniques in the literature.The current pixel can be predicted using gradients. In order to integrate more data in the current pixel, several researchers have suggested using gradient estimation to predict the current pixel. In this paper First, a 3×4 neighbourhood context-based Accurate Gradient Selective Prediction with gradients of the image has been proposed. Later, to more accurately anticipate the current pixel, the Causal pixel method has been utilised in place of linear predictors. In accordance with the pixel's local complexity, adaptive histogram bin shifting has been employed to insert more data with less distortion. TThe experimental study demonstrates that the suggested strategy performs better than a number of other published methods.**

Index Terms—**Reversible data hiding, Accurate Gradient Based Prediction, Adaptive Histogram Bin Shifting.**

I. INTRODUCTION

The main concept of RDH that set apart from other is to reverse the inserted data and tries to get back the original content. The secret bits are added to main content by altering the original pixel values that can be reversed. As the RDH is reversed to get back the original and its secret data, the main content and inserted data are about the same as to its original form. So the value of the each pixel in the restored pixel and secret bits are same as to its original form.

In a number of circumstances in which the recovery of the primary data is essential, this approach has gained in value. There are a variety of RDH techniques in the literature. [1]. The RDH method was originally made public in [1]. Since then, several RDH methods have helped to progress this field. The difference expansion (DE)-based technique proposed in [1] was one of the initial approaches for RDH. The difference between the nearby pixels that are immediately adjacent is investigated in order to add to the primary data with only one bit of information. This topic has developed to the point where several notable research papers in [1].

RDH employing the Prediction Error (PE) Expansion (PEE)-approaches has been determined to be a genre of these approaches that is superior to others and better than others [2]. In PEE-based RDH approaches, the current pixel is predicted using an analysis of a group of context pixels surrounding a neighbourhood. In the PE-of the relevant pixel, data bits are hidden. Researchers have given PEE-based RDH approaches

more consideration due to its advantages. This encourages me to continue investigating PEE-based RDH methods.

Unsurprisingly, a good predictor reduces PE-for a specific pixel value. A good pixel predictor reduces embedding distortion in the pixel because data bits expand in the PE. As a result, the goal of the research, as it is described in this work, is to develop fresh RDH algorithms by investigating appropriate pixel prediction schemes. In the framework of RDH, novel pixel prediction techniques have been developed. The effectiveness of a few cutting-edge pixel prediction techniques has also been looked into in this context. The trade-off between distortion and embedding capacity has improved because to the employment of suitable pixel prediction algorithms.

Depending on the PVO, RDH has varying abilities [3]. The method in [3] utilising PVO separated the image into several, non-overlapping parts. The block's pixel values are then put in ascending order. The 1st highest and 1st lowest values are then determined using the 2nd highest and 2nd lowest values. Numerous papers have looked at the pixel values in order in [3].

Another sort of RDH approach is based on PEE and employs a predetermined set of reference pixels. The number of reference pixels is locally adjusted using the initial set of reference pixels. Several Reference pixel-based estimates are recommended in [4], [5].

The MED is used by the PEE-based RDH in [2], which was initially created as a lossless image coding technique. The GAP used the intensities of the horizontal and vertical gradients to predict a pixel [2]. The RDH technique also employs gradient predictors for predicting pixel values [6], [7], [8], [9], [10].

In order to better predict the current pixel, we suggest in this study adopting a gradient-based prediction with 3×4 neighborhood-based context. Later, a cutting-edge adaptive histogram bin-shifting technique was utilised to better insert the data into the original cover image.

The structure of this paper is as follows: In the context of the 3×4 neighbourhood, gradient-based prediction is examined in section 2. The embedding and extraction utilising adaptive histogram bin shifting are described in Section 3. The experimental results are described in Section 4, and the conclusion is shown in Section 5.

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Gradient Directional Predictor for Reconstructing High-Fidelity Images

Ravi Uyyala ✉ & Jyothirmai Joshi

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Abstract

A good pixel prediction strategy is essential to have a good prediction error expansion based reversible data hiding technique. Several pixel prediction strategies exist in literature. Gradients are used to predict the current pixel. Several Researchers have been proposed based on the gradient estimation to predict the current pixel for embedding more data in the current pixel. In this paper a novel approach based on the gradients of the image using 3×4 neighbourhood has been proposed for better predicting the current pixel. Adaptive histogram bin shifting has been used to insert more data with less distortion, depending on the local complexity of the pixel. The experimental study shows that the proposed technique performs better than some existing methods.

Keywords

Gradients   **Inserting the data into Images**   **Gradients**   **Prediction Strategy**

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Gradient Adaptive Planar Prediction for High-Fidelity Images

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Abstract—A good pixel prediction strategy is essential to have a good Prediction Error- Expansion (PEE) based reversible data hiding (RDH) technique. Several pixel prediction strategies exist in literature. Gradients are used to predict the current pixel. Several Researchers have been proposed based on the gradient estimation to predict the current pixel for embedding more data in the current pixel. In this paper Threshold controlled gradient adaptive planar prediction with gradients of the image using context on 3×3 neighbourhood has been proposed for better predicting the current pixel. Adaptive histogram bin shifting has been used to insert more data with less distortion, depending on the local complexity of the pixel. The experimental study shows that the proposed technique performs better than some existing methods.

Index Terms—Reversible data hiding, Threshold Controlled Gradient Prediction, Adaptive Histogram Bins Shifting.

I. Introduction

The traditional way of hiding data is called lossy data hiding because the cover image cannot be extracted to its original form. In contrast, RDH [1] enables the recovery of the inserted data as well as the cover data from the marked data. Because the cover media can be rebuilt using the marked media, RDH is frequently referred to as lossless data hiding.

The main thing that sets RDH apart is the ability to reverse an embedded image and get the main data back. Data is added to the main data by making a alteration to the pixel values that can be reversed. Because the transformation can be reversed, the main data can be brought back from the embedded data and the hidden data can be taken out at the same time. So, the value of each pixel in the restored image is about the same as its value in the main data.

This technique has become more useful in several applications where the recovery of the main data is very crucial. There are numerous RDH strategies in the literature [1]. The RDH technique was first introduced in [2]. Since then, a number of RDH techniques have advanced this domain. One of the first methods for RDH was the difference expansion (DE)-based algorithm described in [3]. To add a single bit of information to the main data, the difference between the neighbouring pixels that are immediately adjacent is explored. This field has advanced to a number of well-known research works in

[3]. Histogram bin shifting-based RDH is a distinct kind of method presented in [4]. A pair of the cover image histogram's peak and zero points have been used to insert the single data in the histogram bin shifting method [4]. In [5], an RDH approach based on multiple histograms is proposed. Different complexity values of the image are explored to compute the multiple histograms. Then, the secret information is expanded into the image using the optimal bin selection method in [5].

One genre of these techniques that have been found to be superior to others and better than others is RDH using the Prediction Error (PE) Expansion (PEE)-Techniques [6]. In PEE-based RDH techniques, a set of context pixels surrounding a neighbourhood are analyzed to predict the current pixel. Data bits are hidden in the PE-of the concerned pixel. The superiority of PEE-based RDH techniques has attracted more attention from researchers. This motivates me to carry out further research on PEE-based RDH techniques.

Naturally, a good predictor results in less PE-for a particular pixel value. Since data bits are expanded in the PE, a good pixel predictor causes less embedding distortion in the pixel. Hence, the objective of the research, as reported in this paper, is to come up with novel RDH techniques by exploring suitable pixel prediction schemes. Novel pixel prediction strategies have been proposed in the context of RDH. In this context, the performance of several cutting-edge pixel prediction strategies has also been investigated. The use of appropriate pixel prediction strategies has led to a better trade-off between embedding capacity and distortion.

The ability of RDH varies depending on the PVO [7]. The technique using PVO in [7] divided the image into several, non-overlapping sections. The pixel values of the block are then arranged in ascending order. Next, the 2nd-highest and 2nd-lowest values are used to calculate the 1st highest and 1st lowest values. Many articles have examined the ordering of pixel values in [7].

There is also a type of RDH technique that uses a fixed set of reference pixels and is based on PEE. The initial set of reference pixels is used to locally adjust the number of reference pixels. Various Reference pixel-based predictions are suggested in [8], [9].

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Article 65: Neural Network-Based Intrusion Detection System in Hospital Management Systems

by Pawankumar Sharma, Shaik Salma Begum, Deepthi B, N.Pandeeswari, N.Krishnamurthy, R.Vinay Raj

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Quantum Computers Based on Distributed Computing Systems for the Next Generation: Overview and Applications

Kathirvel A., Maheswaran C. P., Subramaniam M., Naren A. K.

Abstract

OS gives life to the computer system. OS will provide managing all resources inside the computer. It will take care of memory management, process scheduling, device managing, managing files and folders, provide user interface, manage applications, etc. Network OS will provide build-in networking capability, multiple system images one per node, managing the resources, scheduling the processes, and sharing the resources. UNIX and Windows NT are good examples for Network OS. Distributed OS manages a group of autonomous computers and makes them appear to the users of the system as if it were a single computer. Distributed OS will provide transparency and networking capability. DOS has control over all the nodes in the system. It will support load balancing using scheduling policies and sharing the resources.

Chapter Preview

Top

Introduction

We can divide the past of modern operating system into the different ages:

1950s: No specific operating system (Assembly languages and low level languages)

1970s: Timesharing operating system (single computer system is shared by many users)

1970s-90s: Distributed operating system (multiple independent users working on different projects)

1980s: Personal operating system (single computer system per user)

1980s: Real time operating system (timely respond to user)

1985s: Network operating system (multiuser)

1990s: Parallel operating system (multiuser)

2000s: Mobile operating system (single smart phone per user)

Many Research and Development efforts (Hamela 2019 a and b) began in earnest in the 1970s and continued through 1990s, with focused interest peaking in the late 1980s. A number of distributed operating systems were introduced during this period given in Voulgaris (2016); however, very few of these implementations achieved even modest commercial success. Some examples of Distributed Operating Systems includes Windows server 2003, Windows server 2008, Windows server 2012, Ubuntu, Linux (Apache Server), AEGIS, AMOEBA and Arachne.

Early personal computer operating systems such as CP/M, Disk Operating System (DOS) and common Mac OS were designed for individual computers (Adelstein et. al, 2005). During the 1980s the need to integrate divergent computers with computer network abilities was grew and the number of networked devices grew quickly. Some examples of network operating systems include Microsoft Windows Server 2003, Microsoft Windows Server 2008, UNIX, Linux, Mac OS X, Novell NetWare, and BSD.

A RTOS (Real Time Operating System) is an operating system anticipated to assist real time applications. It must be fast, timely and quickly responsive, to the schedule tasks and manage allowed limited resources and also process data as it comes in, usually without data buffer interruptions. RTOS should be responding in strict timing, it is a time bound system which has well defined, fixed time constraints. It is working based on either event driven or time sharing manner (Kaashoek et al, 1993). Other main responsibility of an OS such as to manage computer hardware resources, scheduling user applications, files and directories writing in the hard drive, sending information across in computer network, and so on. When an event driven systems switch between numbers of task based on their priorities, whereas timesharing systems switch the numbers of task based on system clock interrupts. When the RTOS must handle various events concurrently and ensure that the OS responds to those available events within the predictable time limit given. Popular commercial RTOS includes PSOS, VRTX, RT Linux, and Lynx.

Four decades back, computers systems are very big in size, most expensive, and normal user cannot afford in the home. It is located in University computer centres and big companies. Most of the big organizations had a single large computer machine in his company in paper Lewis TG (2009), it was shared by many users using time sharing manner. In the 1980s, price of computer system was come down to the point where each user has capability to own personal computer system in his or her home and offices. In 1970 - 80s, First Computer Network ARPANET was discovery and heavily funded by US Military Government. It allows user computer systems were often networked together, so that clients could do user remote logins on other clients or server computer system or share hardware's include disk space, computing power, printers, files and directories in several ways. Currently some computer systems have more than one processor per user, either in the form of a parallel/distributed computer or a huge group of processors shared by a lesser computer user. These computer systems are often called parallel computer systems or distributed computer systems.

A mobile operating system is an operating system for mobile phones, tablets, smart watches, 2-in-1 PCs (that can be convert to a laptop mode or detach and work as a tablet mode), smart speaker, or other mobile devices.

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AI IN CURBING SPREAD OF MISINFORMATION

Abstract

According to Nilsen, there are a number of communication channels that can reduce the availability of meaningful choice. If a corporation gives stakeholders erroneous or biassed information, its decision-making process may be compromised. Prejudice, ambiguity, and emotionally charged language are some communication strategies that may distort meaning or instil unjustified fear in the listener. Public relations experts must use ethical communication techniques built on the ideas of openness and transparency. Artificial intelligence (AI) has become a potent weapon in the fight against the ever-increasing threat of the "infodemic." AI tools can recognise bogus videos, spot fake news, and use chatbots to spread accurate information. Information spreads quickly in the digital era, but false information spreads like wildfire. The ease of communication has made it possible for fake news to spread quickly, and the situation has spread to the point that it resembles an infodemic or a pandemic of information. False information travels considerably more quickly than the truth and reaches a larger audience. In other words, on Twitter and perhaps other social media sites, bogus news outweighs the truth. Furthermore, it is difficult and time-consuming to actively separate bogus news from legitimate news. The procedure may be approached using a few machine learning (ML) classification approaches, however consistently training entire models requires a significant amount of time. It is possible to divide the process of telling fake news from true news into smaller phases, and by automating these processes, the work becomes easier to understand. When disinformation is spread through video, the issue is magnified since it is so convincing and convincingly real that even the most intelligent and sceptical minds can be duped. These artificial intelligence-generated movies of actual individuals acting and speaking false things are referred to as deep fakes. Like many other modern issues, the solution to the rumour-mongering issue is found in artificial intelligence. Here are some of our better examples of how AI can help stop the spread of incorrect information.

Keywords: Artificial Intelligence, Machine learning, Fake news, chatbots.

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