

NATIONAL CONFERENCE
ON
RECENT DEVELOPMENT IN ENGINEERING & APPLIED SCIENCE
(NCRDEAS-2017)
24-26MAY, 2017



Organized by:

Department of Computer Science & Engineering

Department of Electronics & Telecommunication Engineering

Department of Electrical Engineering

Krupajal Engineering College

Bhubaneswar, Odisha, India

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CONFERENCE PROCEEDING

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SCIENCE-2017**



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Krupajal Engineering College, Bhubaneswar, Odisha, India



Chairman's Message

It is a matter of great delight to know that the Department of Computer Science & Engineering, Electrical Engineering, Electronics & Telecommunication Engineering is organizing a National Conference on “**RECENT DEVELOPMENT IN ENGINEERING & APPLIED SCIENCE**” from 24-26May, 2017. To mark this event, the college is going to publish a proceeding comprising all the technical papers presented in the conference. This is a multidisiplinary conference with the objective of bringing together scientists, professors and research scholars from India and abroad in the broad areas of communication, technology and engineering.

I wish the conference a grand success and hope it contributes immensely in the area of computing and engineering.

Dr. Bhabani Charan Rath
Chairman
Krupajal Engineering College



MESSAGE FROM PRINCIPAL

On behalf of Krupajal Engineering College, I welcome you all. The National Conference on Recent Development in Engineering & Applied Science (NCRDEAS-2017) has various scope for different fields like Computer Programming, Networking, Security, Cloud Computing, Machine Learning, Artificial Intelligence, etc. I hope that this conference helped many students, faculty members and researchers for a wide spread are of research. I am very glad to announce that, our Institution had also encouraged and guided the students for their company start-up and at present many of them have started and running their own company with the support of the Incubation department.

I wish all the Successes for the conference.

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Biswal Principal
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Keynote Speaker



Prof.(Dr.) Durga Prasad Mohapatra
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Test Case generation using UML Use Case and State Chart Diagrams

A component of the software development process is software testing. However, when there is a limited amount of time to complete the project, software developers tend to skip this step first. Software developers rarely have enough time to create effective test cases for testing their programs because they typically finish their software construction close to the delivery date. Making experiments physically is a gigantic work for programming engineers in the busy times. In the early stages of software development (before coding), software developers may benefit from the assistance of a tool that generates test cases automatically. For the use case and state chart UML diagrams, a method for creating test cases has been proposed. So that test information can be created prior to coding, so it will be helpful for the analyzer since, Test Designing covers a lot of exercises to guarantee that the eventual outcome accomplishes some quality objective. Software quality assurance relies heavily on software testing. Tragically, programming testing is exceptionally worked escalated and pricey. During the software development process, it can account for approximately 50% of the total cost. Robotized test information age diminishes a work of programming designers for making experiments.

PRESENTED PAPERS

A study on Ensemble and Machine Learning Algorithm to Predict Forest Fires

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Abstract:

In recent years, forest fires have emerged as one of the most common natural disasters. Forest fires have long-lasting effects on the environment because they cause deforestation and contribute to global warming, which is also one of their main causes. The collection of satellite images of the forest is used to combat forest fires, and the authorities are notified in the event of an emergency to mitigate its effects. The fires would have already caused a lot of damage by the time the authorities learned about it. Data associated with forests can be used to predict the likelihood of forest fires through the application of data mining and machine learning methods. This paper utilizes the dataset present in the UCI AI store which comprises of actual elements and climatic states of the Montesinhopark arranged in Portugal. With or without Principal Component Analysis (PCA), various algorithms such as logistic regression, Support Vector Machine, Random forest, K-Nearest Neighbors, and Bagging and Boosting predictors are utilized.

Keywords: Supervised Learning Algorithms, Forest Fires, Principal Component Analysis, Ensemble Learning Algorithms

Introduction:

Timberland fires (otherwise called fierce blazes) have become one of the most often happening calamities as of late. These wildfires are destroying vast tracts of forest land. Global warming, which refers to an increase in the earth's average temperature, is one of the main causes of forest fires. Lightning strikes during thunderstorms and human error are the other causes. Every year a normal of 1.2 million sections of land of woods in the US get annihilated because of the rapidly spreading fires. Between 2016 and 2018, there was a 125% increase in the number of forest fires in India. Deforestation caused by forest fires can have a significant negative impact on human society. The typical course of managing fierce blazes is where the satellite pictures of the woods fires are caught and the specialists are informed by its event and the actions are taken to stop it [1]. However, the above procedure will not take place until the

Texture-Based Automated Classification of Ransomware

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Abstract:

The ease with which user-friendly software can store and manipulate data with much less effort has increased the reliance on digital data. If no security measures have been taken to prevent unauthorized access, this digital data can become extremely difficult to maintain. If security isn't implemented, the entire machine could be infected. If a malicious operation is carried out on the machine by an unauthorized user, data and the entire machine may easily become infected or be lost. By inserting malicious code into the byte code of the source file that is being transferred to the machine, this is possible. These malicious operations have been broken down into various types of malware based on the damage they caused. Ransomware is one of many harmful types of malware that uses an encryption mechanism to prevent a user from accessing his or her own computer's data. The decryption key is not provided until the required ransom is paid. The method that is proposed in this article, in contrast to other methods that have been discussed in the literature, looks at irregularities in the texture of the image. The proposed method makes use of a local binary pattern that is generated from the file that is going to be analyzed. This pattern can be used to immediately detect the file when it is transferred to the victim's computer before it is executed.

Keywords: computerized information, twofold example, malwares

Introduction:

Programs known as malware are undesirable and harmful threats that are designed to compromise a computer's security. Because malware is capable of causing excessive loss and damage to computer security, malware detection has become an essential concern in the cybersecurity community. An enormous amount of malicious software is intentionally created each day. Malware is growing at a rate of 36% per year, according to a 2019 Symantec report [1]. The total number of malware samples is estimated to be over 430 million. The fast development of malware causes a broad danger in our day to day routine. Ransomware encrypts or locks a user's files on their device and demands payment to restore them, which can result in significant productivity losses [2]. Major corporations frequently suffer significant financial losses as a result of data breaches caused by malware [3]. Trojans and spyware are utilized in digital surveillance bringing about harm of international and worldwide relations [4]. Malware has emerged as a major concern for smartphone and computer network users [5, 6].

Deep learning, a method based on artificial neural networks (ANN), can be successfully utilized to combat these threats [7,8]. With its multilayer architecture, deep learning is excellent at learning the characteristics of labeled and unlabeled data. However, every time we use a deep learning model, we must train it on a large data set, which consumes a lot of time and computing power. We can use pre-trained deep learning network architectures and feature extraction to build the classification model to get around this learning obstacle [9].

Privacy and security for IoT: Problems and Solutions Summary

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Abstract:

The Internet of Things (IoT) presents a number of significant obstacles, two of which are privacy and security. IoT faces a number of obstacles, including incorrect device updates, a lack of effective and robust security protocols, user ignorance, and well-known active device monitoring. We are looking at the history of IoT systems and security measures and determining (a) various privacy and security issues, (b) methods used to secure the components of IoT-based environments and systems, (c) existing security solutions, and (d) the best privacy models that are necessary and appropriate for various layers of IoT-driven applications. We proposed a brand-new layered IoT model in this work: generic and stretched with layers identification and privacy and security components. The cloud/edge-supported IoT system that was proposed is being implemented and evaluated. The IoT nodes that are produced as Virtual Machines through Amazon Web Services (AWS) constitute the lower layer. The middle layer, or edge, was implemented using a hardware kit for the Raspberry Pi 4 and AWS's Green grass Edge Environment. The cloud-enabled IoT environment in AWS was utilized for the implementation of the top layer. The security conventions and basic administration meetings were between every one of these layers to guarantee the protection of the clients' data.

Keywords: Cloud, edge, Internet of Things, security measures; cloud services; advanced computing; privacy.

Introduction:

The concept of wired or wirelessly connected objects and devices over the Internet is referred to as the Internet of Things (IoT). As these technologies are utilized for a variety of purposes, including communication, transportation, education, and business development, their popularity has increased rapidly. The idea of hyperconnectivity was introduced by the Internet of Things, which means that individuals and businesses can easily communicate with one another from faraway locations. In order to promote the Radio Frequency Identification (RFID) concept, which includes embedded sensors and actuators, Kevin Ashton invented the term "IoT" in 1999. Nevertheless, the original concept was first presented in the 1960s. The concept was known as pervasive computing or embedded Internet at the time. Ashton presented the Internet of Things idea to boost supply chain operations. Nonetheless, different functionalities of IoT has assisted it with acquiring solid fame in the late spring of 2010. A five-year plan was introduced by the Chinese government to give IoT strategic priority. There are approximately 26.66 billion IoT devices in use today [1]. With the introduction of smart energy meters, wearable devices, and home automation in 2011, the mass explosion began. Organizations have benefited from the rapid growth of IoT and improved market research and business strategies in various ways. In a similar vein, automated services introduced by the Internet of Things have improved people's lives.

IoT-based clustering protocols for agricultural precision

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Abstract:

The Internet of Things (IoT) has made it possible for new applications of Wireless Sensor Network (WSN) technologies to be developed. IoT can play a significant role in enhancing production, quality, and output yield in agricultural monitoring. Many agricultural activities will see significant improvements as a result of the use of WSN and data mining methods. The management of the amount of water in planted fields is one such activity. Likewise, during ongoing years, WSN has turned into a seriously developing field in accuracy cultivating. The use of energy and increasing the life of the nodes are the most significant issues in the development of WSN. The clustering protocols based on soft computing that are utilized in the agricultural sector to extend the lifespan of WSNs are the subject of a systematic analysis in this paper. Different soft computing methods are used for classification: genetic algorithm, fuzzy logic, swarm intelligence, and neural networks. The survey will then present a comparison of soft computing techniques, focusing on their objectives and advantages and disadvantages. The findings of this survey enable the researchers to select the appropriate soft computing method for WSN-based precision agriculture clustering protocols.

Keywords:Swarm intelligence, genetic algorithms, the Internet of Things (IoT), the Wireless Sensor Network (WSN), precision farming, neural networks, and soft computing.

Introduction:

A region's economic development relies heavily on agriculture. Agriculture is an important job [1]. Agriculture provides a source of income for nearly 70% of Indian families [2]. As a result, agriculture needs to be protected and improved. Smart farming was introduced in light of agriculture's significance. The production of various crops is monitored by agriculture and information technologies [3]. Due to the fact that the most important component of farmers' strategies is out of date and does not yield an acceptable level, several issues in agriculture remain unsolved [4]. Stickiness, air temperature, and farmland fundamentally influence plant improvement and the horticulture business, which are significant for maintainability [5]. Sustainable agriculture and intelligent farming, which include crop monitoring in a real environment, smart greenhouses, disease detection in crops, and smart city management, have garnered a great deal of interest from academia and industry alike. The first steps toward fundamental analysis and intelligent farming applications are other obstacles, such as gathering and recording data [8]. With the rapid development of mobile and wireless networking technology, data has spread more widely. Wireless sensor networks (WSNs) are a result of the IoT (Internet of Things) system's battery-operated sensor nodes and low power consumption [9].

Structural Performance of Building Shapes Based on Genetic algorithm

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Abstract:

The design of buildings is an integrated process that includes evaluating structural performance and construction cost in addition to investigating a variety of building shape alternatives. An integrated framework for investigating solid-type building shapes based on their preliminary structural performance is the primary goal of this research. The proposed framework is based on an evolutionary approach that seeks building shapes by employing an implicit redundant representation genetic algorithm (IRRGA). In this approach, objective functions are derived from the synthesis of visual forms or intuitive reasoning in a manner that is analogous to the decision-making process employed by architects. The following parts provide support for the framework: 1) transformation from a building shape to a structural model; 2) evaluation of performance through structural analysis; and 3) total volume optimization as a cost feedback to help choose building shapes. At an early stage of the design process, the framework can assist the architect in determining the acceptability of building shapes.

Keywords:Design procedure, construction cost, building shape, and genetic algorithm

Introduction:In architectural CAD packages generative design is increasingly being included. These generative design tools allow the CAD program to manage the relationships between the parameters of the design and its data, while a normal CAD merely provides drawing tools and stores design data. Using generative design in a design process therefore not only creates documentation of the design but also a model capable of generating variants on the design. These variants can be created by changing some of the parameters. The program then updates the rest of the data according to these parameters using the model created by using the generative design process (Krish, 2011). This ability of the model can be used to optimize certain aspects of the design. The advantage of parametric design alongside optimization algorithms is that the process can evaluate a far greater number of solutions autonomously than a designer could (Sileryte, D'Aquilio, Di Stefano, Yang, &Turrin, 2016). This rapid search for feasible solutions is especially important in the early stages of design when investment into each solution should be kept low (Liu, Chakrabarti, & Bligh, 2003) and the impact of choices is high (Cross, 1993; Turrin, 2014). However, adoption of optimization algorithms in the conceptual design has been slow (Rolvink, Coenders, & Mueller, 2014).The implementation of such an optimization requires a freeform description of the design concept to be coupled to both a performance simulation and an optimization algorithm.

Multiple regression analysis and artificial neural networks based Traffic Volume Forecasting

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Abstract:

The purpose of this study is to develop a model for traffic volume forecasting of the road network in Anamorava Region. The description of the current traffic volumes is enabled using PTV Visum software, which is used as an input data gained through manual and automatic counting of vehicles and interviewing traffic participants. In order to develop the forecasting model, there has been the necessity to establish a data set relying on time series which enables interface between demographic, socio-economic variables and traffic volumes. At the beginning models have been developed by MLR and ANN methods using original data on variables. In order to eliminate high correlation between variables appeared by individual models, PCA method, which transforms variables to principal components (PCs), has been employed. These PCs are used as input in order to develop combined models PCA-MLR and PCA-RBF in which the minimization of errors in traffic volumes forecasting is significantly confirmed. The obtained results are compared to performance indicators such R^2 , MAE, MSE and MAPE and the outcome of this undertaking is that the model PCA-RBF provides minor errors in forecasting.

Keywords: Traffic Volume; Forecasting Model; Multiple Regression Analysis; Artificial Neural Network; Principal Component Analysis.

Introduction:

There have been approximately 850 million automobiles worldwide in recent years as ownership has steadily increased. In any case, the conveying limit of the street is conflicting with the development of vehicle numbers, bringing about long haul clog and stagnation out and about, which not just diminishes traffic proficiency and expands occupants' movement time yet additionally builds the gamble of car accident. It is essential to accurately predict the flow of traffic in each section and offer suggestions for traffic diversion in order to ensure the smoothness of the road. In this paper, we characterize traffic stream as the quantity of vehicles taking a break in the street cut checked by the camera. In order to jointly predict the traffic flow of the target road section, the traffic flow data for each adjacent road section ought to be combined, allowing for partial missing of the previous flow data in this paper.

Review on weather prediction using Machine Learning Technique

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Abstract:

In this paper, we have evaluated the machine learning techniques to predict weather with much accuracy. During this research process we have used following parameters to predict weather: temperature, rainfall, evaporation, sunshine, wind speed, wind direction, cloud, humidity and size of dataset. This research aims to compare the performance of some machine learning algorithms for predicting weather using weather data. From the collected weather data which contains some weather attributes, which are most relevant to weather prediction. In this paper, various Machine Learning Techniques have explored which includes Naive Bayes Bernoulli, Logistic Regression, Naive Bayes Gaussian and KNN. The experimental results show that Naive Bayes Bernoulli algorithm has good level of accuracy than other algorithms.

Keywords: Weather Forecast, Machine Learning Techniques: Naive Bayes Bernoulli, Logistic Regression, Naive Bayes Gaussian, KNN classification, Data pre-processing.

Introduction

Weather forecasting is now the most difficult and crucial method for predicting the weather in any location in today's information technology era [1]. Weather forecasts aid in outdoor programming, crop cultivation, and time management, among other human concerns. Scientists can now more accurately and accurately predict the weather thanks to recent advances in science and technology. The scientists analyze more precise weather forecasts using more advanced technologies and methods. Number of strategies and methods are utilized by the researchers to figure climate; a portion of these strategies are more precise than others. There is colossal measure of climate information accessible which is wealthy in data and can be utilized for climate expectation. The process of gathering information about the weather—such as temperature, precipitation, evaporation, sunshine, wind direction, cloud, humidity, and wind speed—is known as forecasting. Weather data is used to predict climate parameters like temperature, wind speed, rainfall, and meteorological pollution using a variety of machine learning techniques [2]. Decision Trees, Artificial Neural Networks (ANN), Naive Bayes Networks, Support Vector Machines, Fuzzy Logic, Rule-based Techniques, which include Memory-Based Reasoning Techniques and Genetic Algorithms, are among the most frequently utilized Machine Learning techniques for weather prediction.

Utilizing FIDA* Strategy in Routing Wireless Sensor Network

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Abstract:

The primary area of study in the field of wireless sensor network (WSN) routing is the Internet of Things (IoT)-based, cost-effective routing. The fuzzy inference system makes use of three Quality of Service (QoS) parameters in our method: angle, energy, and distance. The probability that a node will become the cluster head is the system's output. The shortest path for data packets to travel from the supply node to the sink node was found using an iterative deepening A*(IDA*) search. The cluster head is chosen using the fuzzy system, and the minimal cost path is chosen using the IDA* search algorithm. The proposed Cost-Efficient Routing in WSN Using Fuzzy IDA* (CERWFI) method was used to find the best path from the beginning node to the end node (sink). The study concludes that the optimal, admissible, and comprehensive IDA* algorithm can address space complexity found in Dijkstra's and A* algorithms.

Keywords-IoT; WSN; QoS; Fuzzy system; IDA* search; shortest route path.

Introduction:

Sensing, processing, and communicating sensor nodes make up a wireless sensor network (WSN). The majority of the time, the nodes are fixed and only rarely require human intervention. It is a unique kind of ad hoc network that has very little mobility, if any [1]. We can use it to keep an eye on and analyze any unknown environment. Commonly, WSNs are information driven. Regardless of mentioning information intended for a hub, information are gathered in view of specific credits, similar to temperature and dampness. To accurately reflect the physical characteristics in a given area, numerous sensors must be used [1]. The development of recent technology has made it possible to install thousands of programmable, multi-parameter-capable sensor nodes within a network. At the location of interest, wireless sensors can be set up without any preparation. Because it saves time and money during installation, this is a huge benefit. Additionally, we may gain additional advantages by replacing a wired macrosensor with smaller wireless sensors at the same cost. One more benefit of WSNs is that the disappointment of one sensor hub doesn't influence the entire organization, since there are neighboring hubs gathering a comparable sort of information in the objective locale [1].

IoT-based smart vehicle and anti-theft system

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Abstract:

Theft of automobiles can be detected by a new security system. This study intends to plan and execute a security framework that in view of web of things innovation (IoT). The owner can control and communicate with the vehicle thanks to the system. Sensors and a camera connected to a Raspberry Pi are used in smart vehicles to implement systems for accident detection and anti-theft. The IoT system sends the vehicle's location to the owner's phone using GPS and GSM/GPRS modules. This vehicle security system aims to prevent theft and establish a connection between the vehicle and its owner. The security system will notify the owner with the vehicle's location whenever anyone other than the owner attempts to start the vehicle. In addition, the system will shut off the power and lock the vehicle. This design introduces a cost-effective, simple, and effective system.

Keywords:GPS, GSM, IoT, Raspberry Pi, anti-theft, accident detection

Introduction

Primitive people would remain isolated from other groups and communities prior to the wheel's discovery. They could drive just inside strolling distance. The early human life was completely transformed by the discovery of the wheel. With time, his social boundaries also grew. The primitive man transformed into a mannered, civilized individual over time, and he also improved the wheel's design. Transportation has become an essential part of our lives thanks to technology. Despite its numerous benefits and applications, we must address the major issue that threatens human life. In terms of statistics, the Ministry of Statistics and Program Implementation reports that 159 million vehicles were registered in India in 2012 and 114 million in 2009.

According to the Delhi Statistical Hand Book, the number of registered motor vehicles increased from 534,000 in 2014 to 877,000 in 2016, resulting in an increase in the number of accidents and, consequently, fatalities.

Mobile Ad Hoc Network's Virtual Solution for Network Data Crowding Aurobindo Kar¹, Rashmi Manjari Jayasingh²

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Abstract:

There are numerous bodily characteristics in cellular environments, such as shadowing influence, transmission disturbance, and multipath diminishing, among others. Aside from this, the repetitive movement of specially appointed hubs might cause strong change of geography alongside unpredictable organization among hubs. On account of these sort of attributes, it very well may be confounded to straight away use TCP/IP to impromptu systems administration. Ad hoc networking typically involves the transmission of information between nodes. However, because of the activity of nodes and powerful topology changes, routing typically requires the assumption that there is at least one complete end-to-end transmission route between two nodes at some point. MANET routing data transfer with effective messaging control is the focus of this paper.

Keywords: disturbance in the transmission, shadowing, diminishing multipaths, topology, TCP/IP, ad hoc network, routing, and MANET

Introduction

Lately, remote organizations have grown quickly in supporting versatility. There are two types of mobile wireless networks based on whether or not the mobile communication system has infrastructure. A network that includes infrastructure is the first type. Within the communication range, the mobile node uses the base station that is closest to it to carry out communication. In such an organization, a versatile hub is identical to a portable terminal. It lacks routing capabilities, and only mobile switches are in charge of routing and switching. Commonplace instances of this kind of organization are cell remote frameworks, office remote LANs, etc.

A mobile network without infrastructure is the second type (Figure 1). It is an independent remote multi-jump organization. There is no fixed infrastructure or routers across the entire network. All of the nodes are mobile and have the ability to dynamically maintain any kind of contact with other nodes. Due to the terminal's limited wireless coverage, two user terminals that are unable to communicate directly can forward packets with the assistance of other nodes in this environment. Every hub can be supposed to be a switch, and they should have the option to find and keep up with courses to different hubs.

Platforms, Applications, Research Concerns, and Challenges in Cloud Computing

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Abstract

The development of parallel computing, distributed computing, grid computing, and virtualization technologies known as cloud computing is the defining feature of a new era. Distributed computing is an arising model of business registering. In this paper, we investigate the idea of cloud design and contrasts distributed computing and lattice processing. We also talk about the features and uses of a few well-known cloud computing platforms. We hope to identify the difficulties and issues associated with cloud computing in this paper. From the perspective of cloud computing adoption, we identified a number of obstacles and highlighted the cloud interoperability issue, which calls for significant additional research and development. However, users face significant difficulties adjusting to cloud computing systems due to concerns about privacy and security. In this paper, we look into the privacy and security concerns of several cloud computing system providers.

Keywords: parallel computing, distributed computing, grid computing, virtualization technologies and cloud computing.

Introduction:

According to Kogias, Xevgenis, and Patrikakis (2016), cloud computing lets users get the computing services and resources they need without having to buy their own infrastructure. Instead, they only pay for what they use. Models predict that cloud computing will be seen everywhere or referred to as ubiquitous. This makes it convenient for everyone involved, who can request configurable computing resources via network access as needed. Networks, applications, data storage, servers, and various services are examples of these computing resources. According to Mell and Grance (2011), the resources can be provided with very little interaction with service providers, requiring very little management effort. The term "cloud computing" refers to both the application that is provided to an organization as a service and the hardware and software that provide services (Armbrust et al., 2010).

The potential benefits of cloud computing include the potential to reshape how IT hardware is purchased based on an organization's requirements and its potential to transform the IT industry. It cuts down on the amount of money needed to put innovative ideas into action, which would otherwise require a lot of money to set up the hardware environment for such ideas (Armbrust et al., 2010). The idea of virtualization is the core of cloud computing. The technology of virtualization is not new; it was discovered in 1967,

A study on Application of Data Mining in Agriculture

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Abstract:

A lot of data is used by agricultural organizations today. In the plethora of agricultural data, significant data must be processed and retrieved. Usage of data and correspondences innovation empowers robotization of removing huge information with an end goal to get information and patterns, which empowers the end of manual errands and simpler information extraction straightforwardly from electronic sources, move to get electronic arrangement of documentation which will empower creation cost decrease, better return and higher market cost. By analyzing data from various perspectives and discovering connections and relationships in seemingly unrelated data, data mining enables agricultural businesses, in addition to information about crops, to predict trends regarding customer conditions or behavior. Agriculture-related raw data are abundant and varied. The development of an agricultural information system is made possible by the integration of their collection and storage in an organized manner. In agriculture, there are a lot of opportunities for data mining to look for hidden patterns in these data sets. Customers' situations in agricultural businesses can be assessed using these patterns.

Keywords: Information systems, agriculture, data mining, data processing, agricultural businesses.

Introduction:

Identifying the variety of customers who purchase the offered products or services and establishing a relationship with them so that they remain a source of revenue for the business in the future is now an essential part of doing business. Indeed, attracting new customers is just as important as keeping valuable old ones [1–3]. Examining the characteristics of various groups of customers is one method for gaining a deeper understanding of them. Analyzing customer behavior and selecting the appropriate marketing strategy may determine a company's ability to survive in highly competitive markets where customers have numerous options [4].

Businesses in the agricultural sector, information systems, data mining, and processing

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Abstract:

A lot of data is used by agricultural organizations today. In the plethora of agricultural data, significant data must be processed and retrieved. Usage of data and correspondences innovation empowers robotization of removing huge information with an end goal to get information and patterns, which empowers the end of manual errands and simpler information extraction straightforwardly from electronic sources, move to get electronic arrangement of documentation which will empower creation cost decrease, better return and higher market cost. By analyzing data from various perspectives and discovering connections and relationships in seemingly unrelated data, data mining enables agricultural businesses, in addition to information about crops, to predict trends regarding customer conditions or behavior. Agriculture-related raw data are abundant and varied. The development of an agricultural information system is made possible by the integration of their collection and storage in an organized manner. In agriculture, there are a lot of opportunities for data mining to look for hidden patterns in these data sets. Customers' situations in agricultural businesses can be assessed using these patterns.

Keywords: Data mining, agriculture, data processing, information systems, agricultural enterprises

Introduction:

In terms of farm output, India currently ranks second in the world. India's socioeconomic fabric is significantly shaped by agriculture, which is the demographically broadest economic sector. Crop production in agriculture is a one-of-a-kind business that is affected by numerous climate and economic factors. Soil, climate, cultivation, irrigation, fertilizers, temperature, rainfall, harvesting, pesticide weeds, and other factors are some of the factors on which agriculture is dependent. For the operation of industries-related businesses' supply chains, historical crop yield data is also crucial. These enterprises utilize horticultural items as natural substance, domesticated animals, food, creature feed, synthetic, poultry, manure, pesticides, seed and paper. These businesses can plan supply chain decisions like production scheduling with the assistance of an accurate estimate of crop production and risk. Based on estimates of crop production, industries like the seed, fertilizer, agrochemical, and agricultural machinery industries plan production and marketing activities

[1, 2]. There are 2 variables which are useful for the ranchers and the public authority in decision making to be specific:

IoT Security Using a Random Forest Algorithm

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Abstract:

New channels for the detection of such attacks have emerged as a result of recent advancements in programmable networks, particularly the programmability of data planes in switches and routers. This paper suggests using Random Forests, a machine learning technique, to quickly and reliably identify DoS attacks in a programmable switch, taking advantage of this newly discovered capability. Random forests employ a large number of procedurally generated classification trees, each of which independently classifies an input into one of a number of classes. After that, a network flow will be categorized by each decision tree as either a legal user flow or a potentially dangerous one, such as a component of a Denial of Service (DoS) attack. Despite the fact that multiple classification trees are utilized to improve accuracy, random forests are extremely light due to the fact that only a small number of straightforward calculations are required for each classification tree. Due to the simplicity of the operations performed in each tree, programmable switches are an excellent choice for employing this strategy because of their limited resources and need for rapid processing to function at line rate.

Keywords: Denial of Service (DoS), IoT, Machine Learning, Support Vector Machine, KNN.

Introduction

Due to the ease with which the IoT can integrate the physical world and computer communication networks, as well as applications (apps) like infrastructure management and environmental monitoring, future IoT systems must incorporate privacy and security measures. Security issues like malware, eavesdropping, spoofing, intrusions, distributed denial-of-service (DDoS), and DoS attacks must be addressed by IoT systems, which combine cloud computing, wireless sensor networks (WSNs), and radiofrequency identifications (RFIDs). For instance, wearable devices that collect and transmit user health data to a connected smartphone must prevent the leakage of personal information. When dealing with large amounts of data, IoT devices typically lack the processing power, memory, radio bandwidth, and battery life required to complete computationally demanding and latency-sensitive security tasks.

A Review of Deep Learning-Based Methods for Predicting Molecular Property

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Abstract:

At the moment, deep learning is widely used in a variety of fields due to its precise performance. The current state of research on deep learning in molecular property prediction applications is thoroughly examined in this review from three perspectives: compares the advantages and disadvantages of supervised learning, semi-supervised learning, and unsupervised learning. The most extensive research to date focuses on supervised learning-based molecular property prediction. Nonetheless, the examination pattern has advanced toward semi-regulated learning and unaided learning.

Keywords: Deep learning, molecular property prediction.

Introduction:

In drug design and substance discovery, an important issue is molecular property prediction (MPP). It helps speed up drug discovery, reduce costs associated with research and development, and improve chemical design. As indicated by the different anticipated properties, the sub-atomic property forecast issue can be partitioned into grouping errands (like poisonousness) and relapse undertakings (like atomization energy). While explicit physical images are provided by traditional methods based on density functional theory, processing a large number of molecules takes time. The prediction of compound properties using machine learning has received a lot of attention from researchers in recent years, and one of the most common approaches is quantitative structure-activity relationships (QSAR). The fundamental premise of QSAR is that a molecule's properties are determined by its structure; Specifically, a compound's molecular structure can be used to predict its biological activity. One more significant use of QSAR is virtual separating drug revelation, which diminishes the quantity of applicant intensifies that should be tentatively tried, accordingly lessening improvement expenses and accelerating the medication disclosure process.

A systematic approach on IoT-Based Health Monitoring System

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Abstract:

Health is one of the most pressing issues facing humanity today. Lung failures, heart-related diseases, and cardiac illnesses are all on the rise. The health of elderly patients or hospital patients must be monitored, but practitioners and doctors must be on constant watch in order to do so. The Web of Things (IoT) and the use of data innovation hugely affect how medical care is given. As part of the IoT health monitoring system that is being proposed, a portable device with sensors that can detect a variety of physiological parameters, such as the patient's body temperature, blood pressure, electrical heartbeats as seen on an electrocardiogram (ECG), blood oxygen saturation, heart rate, body fall detection, traumatic brain injury, and activity monitoring, would be made. After that, the information would be sent via the Internet to a medical server. With this, doctors can better diagnose patients and monitor their health remotely. The device also has an emergency alert feature that notifies the patient and doctors when sensor values exceed specified thresholds. Utilizing the Internet of Things (IoT) for remote monitoring and data collection, patients can avoid life-threatening situations and receive prompt, cost-effective medical care. Users can also check their health indicators on a regular basis and seek treatment for any irregularities early with a portable health monitoring device.

Keywords: System on a chip (SoC), MQTT (Message Queuing Telemetry Transport), Internet of Things (IoT), remote health

Introduction:

A variety of risk factors, including eating habits, inactivity, and alcohol consumption, are contributing to an increasing number of chronic illnesses in low- and middle-income nations. As indicated by World Wellbeing association, 4.9 million individuals kick the bucket from cellular breakdown in the lungsthrough snuff use, 2.6 million hefty individuals, 4.4 million high cholesterol and 7.1 million hypertension. Persistent illnesses change enormously in their side effects development and their treatments. Traditional tests in specialized health facilities were the standard method for measuring blood sugar, blood pressure, and heart rate for many years.[1] Some, if not observed and treated early, can end a patient's life.

Utilizing Supervised Learning to Predict the Line Voltage Stability Index

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Abstract:

Stability issues have taken over in a deregulated environment. For the power system to function properly, the power must be reliable. The energy management center's system operator faces new decisions regarding control strategies when faced with high and dynamic loading conditions frequently. The identification of weak buses is critical to achieving voltage stability. In the overloaded system, line stability indices are important predictors of weak buses. The first step in the control strategy is to find the weak buses. The Fast Voltage Stability Index (FVSI) can be accurately predicted using a method that is presented in this paper. It is based on an Artificial Neural Network (ANN). The ability of FVSI to predict is the basis for comparative analysis of various ANN topologies. The offline Newton Raphson (NR) simulation method is used to verify the results. Over the IEEE-14 and IEEE-30 test bus systems, the proposed methodology is evaluated.

Keywords: FVSI, IEEE test bus system, ANN, N-R Method

Introduction:

Many nations' power systems experience blackouts and technoeconomic depletions as a result of voltage instability issues [1]. The amount of voltage stability margin (VSM) that is readily available is, as a result, an essential criterion for assessing the viability of a power system network (grid infrastructures). In the face of constantly shifting load demand and generation dynamics, voltage stability monitoring (VSM) is frequently regarded as a means of determining how long a particular power system can continue to function [2,3]. It can theoretically be calculated as the distance between a current operating point and the closest voltage collapse point as real and reactive loading increases continuously [4].

For the most part, the limit of existing lattice frameworks to oblige expanded load and now and again expanded age, particularly from environmentally friendly power sources, is exceptionally restricted.

Research on Minimizing Payment Cost of Multiple Cloud Service Providers

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Abstract:

A lot of businesses today are moving their workloads to cloud storage to save money on capital for building and maintaining hardware infrastructures and to avoid the complexity of managing data centers. This research aims to reduce the cost of payment for multiple cloud service providers. Cloud computing is now a well-known business service. Using these globally dispersed data centers, the CSP (Cloud Service Provider) provides data storage services that include the Get and Put functions. The selection of various CSP datacenters and cloud customers faces two obstacles: the first is determining how to allocate data to the worldwide datacenters in order to fulfill the requirement of application Service Level Objectives (SLO), which includes both data availability and retrieval latency; the second obstacle is determining how to allocate reserve resources and data in the datacenters that belong to various CSPs in order to minimize the cost of payment. Utilizing integer-programming techniques to handle cost-minimization issues was the first step in determining how to resolve these issues. First, multicast-based data transfer, then coefficient-based data reallocation, and finally, request redirection-based congestion and the PPM-C (Prediction by Partial Matching-Cloud) data compression technique were used to cut down on storage costs and processing time for data transfers.

Keywords: Administration Level Goals, Distributed computing, Assets Reservation, CSP, Installment Cost Minimization, PPM-C pressure, and Information Accessibility.

Introduction:

Amazon S3, Microsoft Azure, and Google Cloud Storage are just a few examples of popular cloud storage services. Using its geographically dispersed datacenters, each cloud service provider (CSP) provides a global data storage service, including Gets and Puts. More and more businesses are shifting their data workloads to cloud storage in order to avoid the complexity of managing datacenters and save capital expenditures on building and maintaining hardware infrastructures [4]. Web applications like web portals and online social networks offer services to customers all over the world. Web applications, which have an impact on the incomes of cloud customers, are impacted by the availability and delay in data access. Experiments carried out at the Amazon portal, for instance, [5] demonstrated that even a modest increase of 100 milliseconds in the time it takes to present a webpage significantly lowers user satisfaction and decreases sales by one percent.

Nationality Identification using Handwriting and signature biometrics

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Abstract:

Handwriting and signature biometrics, particularly in terms of identity recognition and verification have a long history. The process of handwriting analysis involves examining someone's writing. Graphology is the term used in science to describe handwriting analysis. It is a technique for extrapolating a person's personality and behaviour from his writing quirks. When crimes include people of different nationalities, it can be difficult for forensic investigation teams to pinpoint the crime. There are many uses for categorising handwriting according to factors like age, gender, and nationality. Investigations in forensics can be narrowed down to a particular type of writer with the aid of handwriting classification. This project proposes a new method for ethnicity (nationality) identification.

Keywords: Handwriting analysis, COLD features, Ethnicity identification, Nationality identification.

Introduction:

In today's world, numerous crimes like robbery, rape, murder, genocide, suicide, and other fatalities are emerging, resulting in global high levels of insecurity. People become anxious and afraid as a result of the increased instability, making it difficult for them to complete their daily tasks. In order to deal with this disaster, the government and other private sectors have hired a number of experts to look into the causes of damage and harm. The experts are able to investigate and identify the criminals, who will then face consequences for their actions, by employing a collection of tools, materials, scientific measures, and theories. According to Bogan& Roberts (2011), graphology is the study of the art of handwriting and the application of handwriting analysis to the evaluation of individuals in industries. The examination is a legitimate sign of conduct and character and hence a helpful instrument for the majority modern exercises like enlistment, choice, dropping, meeting, profession arranging and group building. According to Bradley (2006), the investigation of graphology makes use of three hundred distinct characteristics. The understanding of psychological art that blends with the scribbling features is where graphologist knowledge lies.

Overview of Open-Source Machine Learning Products with Privacy Protection at the Level of Practice

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Abstract:

The purpose of this paper is to provide a high-level overview of machine learning techniques known as "Privacy-Preserving Machine Learning" that preserve the confidentiality and privacy of customer data. Offline-learning privacy methods' security practices are first evaluated. Those concentrated on cutting-edge cryptographic techniques like Homomorphic Encryption and Secure Multi-Party Computation, in addition to specialized software and hardware platforms like Intel® Software Guard Extensions (Intel® SGX). Our Proof of Concept, in which the speed and accuracy of the security solutions will be examined, is the result of combining various machine learning architectures with security approaches. The next step was to investigate and compare Open-Source Python-based PPML solutions. From almost 40 distinct, cutting-edge systems, four were chosen: SyMPC, TenSEAL, TF-Encrypted, and Gramine. To demonstrate the capabilities of various libraries, three distinct neural network architectures were created. The MNIST dataset serves as the foundation for the POC's image classification solution. All of the considered secure approaches have comparable accuracy, as the computational results demonstrate. The difference between secure and non-secure flow is not more than 1.2 percent. As far as secure calculations, the best Protection Safeguarding AI library depends on Confided in Execution Climate, trailed by Secure Multi-Party Calculation and Homomorphic Encryption. Nevertheless, the majority of those are at least a thousand times slower than the unsecured evaluation. Sadly, it is unacceptable in a real-world situation. The implementation of hardware-accelerated secure computation, the exploration of additional cutting-edge libraries, and the combination of various security approaches are all possibilities for future work.

Keywords: Privacy-Preserving, Machine Learning, Deep Learning, algorithm

Introduction:

In the modern technical era, the superiority of DL models over humans has been observed. For instance, the Food and Drug Administration of the United States has granted approval to an intelligent diagnosis system for medical images that do not require human intervention [1], [2]. The IPAS division of Intel employs Konrad Kuzniewski, Krystian Matusiewicz, and Piotr Sapiecha (e-mail: krystian.matusiewicz@intel.com and piotr.sapiecha@intel.com) Machine Learning as a Service, or MLaaS, is the term used in the scientific literature to describe the practice of outsourcing deep model training and evaluation to clouds. These services are provided by cloud service providers like Google, Microsoft Azure, or Amazon Web Services. Numerous recent studies have raised concerns regarding the security and robustness of machine learning models [3–5] despite the impressive performance of DL algorithms. Additionally, there are concerns regarding the safety of these algorithms' execution environments [6–8].

Covering Approximations Way to deal with Span Requested Data frameworks

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Abstract:

It is been demonstrated that the hypothesis of unpleasant set is exceptionally advantageous in working with struggle issues actuated by the data charm. The first thought of the harsh set isn't exact, in any case, when inclination orders of attributes spaces (standard) are to be thought of. A novel mathematical method for establishing a control-based rough set approach seeks the issue of covering approximation in relation to a control relation in interval-ordered information systems. Topological generalizations, control relations, approximations, and interval information systems are all applied by these mathematical tools. Our method produces results that are more accurate than those produced by conventional methods like Pawlak's. With a single value, topologies replicate various types of information systems. We made the Pawlak approximation space into a covering approximation space by defining a control relation for interval information systems. After that, we use this method to work with interval-ordered information systems. The proposed method's results allowed for the creation of two distinct rough approximations, the j-lower and j-upper approximations. Topological generalizations were used to apply j-rough concepts like membership, equality, and inclusion relations. The outcomes obtained from interval information systems have been enhanced by our proposed method. We employ the covering approximation in the rough set approach because there are numerous improved methods for investing generalized approximation relative to a control relation in interval information systems in this study. The Pawlak strategy applied to interval information systems has been extended to include this. By developing new algorithms that make the calculations easier, this strategy paves the way for additional generalizations.

Keywords: Topological Spaces, Rough Sets, Rough Approximations, Accuracy Measures, Data Classifications

Introduction:

The primary objective of the Minimum Spanning Tree (MST) problem is to find the cheapest tree that covers all n nodes of a given edge-weighted graph $G = (V, E)$. Several natural generalizations and variants of the problem have been considered in order to deal with the particulars of real-world applications. In the Steiner Tree problem, for instance, we only need to connect a certain subset of W of k terminal nodes. Instead, the objective of the k -MST problem is to connect at least k (arbitrary) nodes. These generalizations all have one thing in common: we have to design a single network. However, in many applications, this is not the case. For instance, assume we need to give basically k out of n clients with both power and water

An Investigation of the Present Data Aggregation Method for Wireless Sensor Networks

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Abstract:

The wireless sensor network plays a significant role in a variety of applications of the upcoming advanced wireless technology for efficient communication, including smart homes, the commercial sector, the defense industry, and modern agriculture. Throughout the communication process, there are numerous issues and difficulties. The most difficult and fascinating topic among researchers is energy conservation. This is because in a wireless sensor network, there are n sensor nodes that can recognize and send data to the base station or sink either directly or through an intermediate node. The data rate or flow is complicated by these low-energy nodes, which have a significant impact on the wireless sensor network's lifespan. Before sending the best data to the sink or another device, the sensor node must discard any unnecessary data it receives from nearby nodes in order to reduce energy consumption. Numerous sensors can identify a specific target when it is located in a particular sector. This paper presents the Data Agglomeration Technique, which is one of the persuasive methods for ignoring unnecessary data, increases WSN lifespan, and improves energy efficiency to address this issue. The effective data aggregation paradigm can also reduce network traffic. The various data agglomeration techniques for maximizing energy efficiency in WSN were discussed in this paper.

Keywords: Data agglomeration, clustering, energy-saving routing.

Introduction

A wireless sensor network is a network without cables that connects routers, base stations, sensors, and other devices. Among these sensors, humidity, temperature, health monitoring, target tracking, surveillance, wind direction and speed, power-line voltage, vibration intensity, pressure, sound, motion, pollutants, and seismic events, among other things, play a significant role in this field (1-4). Remote sensor network contains n number of assortments of remote sensor hubs. The energy that these groups of wireless sensor nodes need to collect, analyze, and send their data to a sink or base station over the network is limited. The sink acts as an intrusion between the user and the network. Sensor nodes are lightweight, portable, and small. Radio signals are being used to communicate among sensor nodes. A transducer is one of four components that each sensor node uses to generate electric signals from sensed data. Second, the sensor's output is processed and saved by microcomputers. Thirdly, the transceiver transmits data to the computer after receiving it from the server. Last but not least, the battery's energy source is the most important factor (5). If a sensor node stops working because it doesn't have enough energy, there will be a big problem and the protocol will fail badly (6). The battery cannot be recharged while the nodes are deployed in a belligerent environment.

Slicing-based energy-efficient data aggregation protocols

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Abstract

Wireless sensor networks (WSNs) have emerged as one of the most robust strategies in the network domain. However, due to their broadcast communication mode and unattended deployment, WSN sensor nodes frequently become targets for criminals. Slice-Mix-Aggregate (SMART) needs to exchange messages frequently in a network, which puts a lot of strain on sensor nodes with limited resources, despite the fact that it can prevent sensitive data from being compromised. This paper proposes an energy-efficient and privacy-preserving data aggregation protocol based on slicing (EPPA) to address these issues. EPPA uses a novel slicing mode to reduce the number of slices and can significantly reduce communication overhead while also significantly preventing data compromise. In the meantime, an improved EPPA-based scheme known as the multi-function privacy-preserving data aggregation protocol (MPPA) is presented. MPPA supports multiple data aggregation functions such as max/min, count, and mean. The proposed aggregation protocols perform better in terms of privacy protection and communication efficiency, according to the theoretical analysis and simulation evaluation.

Keywords: Privacy preserving, Data aggregation, Data slicing, Euclidean-based decomposition

Introduction

Low-power wireless embedded sensors have emerged, highlighting their potential for remote data collection and sensing. This has significantly aided in the spread of the Internet of Things (IoT) in applications like: brilliant urban communities, guard, reconnaissance, medical services, horticulture, power networks, and so on. A battery-powered embedded wireless sensor that typically consists of a transceiver, antenna, microcontroller, and the sensing mechanism is central to this development. The ability to aggregate, process, compute, communicate, and network with other wireless sensors, actuators, and IoT devices is given to the wireless sensors.

Semi-supervised Hierarchical Optimization-based Propagation Algorithm

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Abstract:

The Semi-supervised Hierarchical Optimization-based Affinity Propagation Algorithm (SHO-AP) was proposed as an improved AP algorithm due to the low accuracy of the original Affinity Propagation (AP) algorithm, which is greatly influenced by preference (P) when adjusting it to obtain the true class number of clustering. This is due to the fact that the accuracy of clustering is not high. The calculation presents the possibility of semi-oversight, by setting a specific extent of name information and utilizing the AP to group, then lay out the management and non-oversight data framework to upgrade, and consolidate the consequence of AP calculation. The final clustering results are combined using hierarchical optimization. The experiment on UCI data sets demonstrates that the proposed algorithm outperforms the conventional AP algorithm in terms of quality and the number of classes.

Keywords: Prior knowledge, hierarchical optimization, and semi-supervised clustering

Introduction:

More and more data are being made available in open source as a result of the effective and rapid pace at which information is gathered. In genuine grouping errands, a huge part of tests in datasets are unlabeled, and getting their names is exorbitant and tedious. In machine learning, one of the most important issues is how to fully utilize unlabeled data and investigate the potential value of unlabeled samples. SSL has been proposed as a solution to the problem of a lack of labeled samples because it can use both a large proportion of unlabeled samples and a small number of labeled samples to improve learning performance [1,2]. As of late, different SSL calculations have been proposed, for example, transductive help vector machines (TSVM) [3], co-preparing [4], name engendering calculation (LPA) [5], mixmatch [6], fixmatch [7], and so on. In addition, many real-world tasks use SSL, such as object detection [8,9,10], remote sensing [11,12,13,14,15,16,17,18,19,20], and data mining [21,22].

A survey of difficulties and arrangements in the plan and execution of profound chart brain organization

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Abstract:

The study of graph neural networks has shown that they can open up new applications in a wide range of fields by employing a fundamental method that is beyond the scope of other deep learning designs. In order to fully utilize the power of graph data, researchers are working to overcome a number of limitations that limit their expressiveness. There are a number of publications that look into the limitations and bottlenecks of graph neural networks (GNNs), but one thing they all have in common is that they can all be traced back to message passing, which is the main method we use to train our graph models. In this study, we describe the general GNN design pipeline, discuss solutions to the over-smoothing problem, classify those solutions, and identify research challenges.

Keywords: Over-smoothing and over-squashing in graph neural networks and geometric deep learning

Introduction:

The "vague reaction of the body to any request upon it" that is referred to as stress is a particularly fascinating and full of feeling state. This is due to the harmful effects of long-distance stress, which can cause everything from headaches and trouble sleeping to an increased risk of cardiovascular diseases. Mentioning position are a basic justification for tension in people. Some of the things that cause pressure include being constantly open to risk, having short cutoff times, doing extensive work, or even running boring errands. As a result, pressure-relief mediations could be initiated with the help of non-intrusive pressure-detecting instruments that persistently monitor feelings of anxiety while having negligible effects on specialists' regular routines. These applications were unable to provide better and less expensive mediations in stressful workplaces; however, they did provide more advantageous conditions in which employees were more likely to manage their responsibilities.

The Effect of Business IT Key Arrangement on Corporate Execution

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Abstract:

The Effect of Strategic IT Alignment in Business on Corporate Performance The function of information technology is essential to the advancement of a company's business management. In the fierce competition, particularly among distributors of electrical appliances, businesses must employ strategies to differentiate themselves and cut costs. By streamlining IT/IS, the implementation of cost reduction reduces business processes. However, information systems like stock data collection and transaction problem reporting have not yet been implemented in business processes. As a result, businesses must devise the appropriate technology strategy in order to adapt dynamically to technological shifts. In light of the issues that emerge, this exploration is simply restricted to vital preparation of data frameworks and application portfolios utilizing the Ward and Peppard approach since it centers around planning the organization's interior outside factors with respect to business and innovation. Within five years, this study hypothesizes that the determination of the strategy can result in the successful implementation of the application in an electrical appliance distributor company. The exploration stage starts with gathering information from the writing, meets, and direct perception. Utilizing the Ward and Peppard method, conduct a subsequent investigation of both the internal and external environments. The mapping of the Critical Success Factors (CSF) that must be evaluated using the IT Balanced Scorecard is based on the findings of the environmental analysis. An application portfolio represents the proposed strategy for business, management, and IT systems that emerged from this investigation.

Keywords: Strategic Planning, Ward and Peppard, CSF, IT Balanced Scorecard

Introduction:

All through a large portion of present day business history, organizations have endeavored to open worth by matching their designs to their systems. For instance, as mass production took hold in the nineteenth century, businesses centralized key functions like operations, sales, and finance to create enormous economies of scale. A rival model emerged a few decades later as businesses expanded and expanded their offerings. Businesses like General Motors and DuPont organized themselves into business units based on products and geographic markets. While sacrificing some economies of scale, the smaller business units were more adaptable and flexible to local conditions. These two plans of action — brought together by capability versus moderately decentralized side-effect and locale — demonstrated solid for quite a while, to a great extent on the grounds that the development of business association was genuinely gradual. In fact, the product division structure was the most popular model for at least 50 years. However, as competition increased in the final quarter of the 20th century, issues with both models became apparent, and businesses sought out novel organizational strategies to unlock corporate value.

A Kernel-Based Node Localization in an Anisotropic WSN

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Abstract

The primary issue with wireless sensor networks (WSNs) is still the localization of sensors. Low accuracy is the fatal flaw of range-free node localization in WSN, which is unfortunate. The problem of anisotropic WSN node localization is transformed into the problem of kernel regression when we apply kernel regression to it in this paper. Classical DV-Hop is contrasted with the proposed radial basis kernel-based G-LSVR and polynomial kernel-based P-LSVR in isotropic and anisotropic WSNs with varying proportions of beacons, network scales, and communication range disturbances. G-LSVR presents the best limitation exactness and dependability from the reenactment results.

Keywords: WSN, DV-Hop, Localization, localization accuracy

Introduction

Localization of wireless sensors remains the primary issue with wireless sensor networks (WSN) at this time. The confinement calculations of WSN can be grouped into the reach based estimation technique and the reach free estimation strategy. The first can achieve high accuracy with range information [1–4], whereas the second can achieve low accuracy without range information.

Machine learning is applied to the localization of WSN in order to enhance the accuracy of range-free node localization [5]. Particularly, range-free localization algorithms made use of artificial neural networks (ANNs), and when compared to other traditional algorithms, their accuracy and performance were significantly improved [6–12]. In addition, Phoemphon et al. [13, 14] have utilized range-free localization in WSNs with fuzzy logic. The less complex heterogeneous scenarios are the primary focus of this algorithm. A diagram based restriction calculation was introduced utilizing regular brain organizations (CNN) and support vector machine (SVM) [15] in the paper. In [16], another SVM-based localization strategy for massive WSNs was proposed.

A study on Artificial Intelligence in Power Systems

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Abstract:

A continuous and reliable supply of electricity is necessary for the functioning of today's modern and advanced society. Since the early to mid 1980s, most of the effort in power systems analysis has turned away from the methodology of formal mathematical modelling which came from the areas of operations research, control theory and numerical analysis to the less rigorous and less tedious techniques of artificial intelligence (AI). Power systems keep on increasing on the basis of geographical regions, assets additions, and introduction of new technologies in generation, transmission and distribution of electricity. AI techniques have become popular for solving different problems in power systems like control, planning, scheduling, forecast, etc. These techniques can deal with difficult tasks faced by applications in modern large power systems with even more interconnections installed to meet increasing load demand. The application of these techniques has been successful in many areas of power system engineering.

Keywords: Artificial intelligence, Power system engineering

Introduction:

The primary objective of power system control and operation is to ensure the stability and dependability of power systems and provide customers with high-quality, cost-effective electricity. As a result, planning for power system monitoring and control is necessary. However, as the electric power system grows, so does the demand for its safe, cost-effective, and dependable operation. As a result, the workload of staff members has also increased. The PC programming of the current EMS focus is normally the mathematical examination programming, it is troublesome to have the objective handling in activity of the power framework, particularly in the shortcoming condition. The efficiency with which incidents are handled and the workload of operational staff are both greatly reduced when artificial intelligence techniques are used to assist them in checking and judging. This is one of the primary reasons why artificial intelligence research has grown in popularity in recent years [1].

A Data-Driven Approach to Air Conditioning System Fault Detection and Diagnosis

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Abstract:

In recent years, extensive building equipment automation has resulted in the accumulation of a significant amount of operation data for air conditioning systems. This data can be used to investigate Fault Detection and Diagnosis (FDD) for air conditioning systems. For FDD modeling of air conditioning systems, a data-driven approach based on intrinsic correlation and data regularity is more advantageous. According to the relevant literature, input training samples are necessary for data-driven FDD models. A literature review is divided into sections according to whether the data-driven methods are supervised or unsupervised and whether the training samples have labels, such as fault labels. Regression and classification are two examples of supervised data-driven methods. Principal Component Analysis (PCA), cluster analysis, and association rule mining are examples of data-driven techniques that do not necessitate supervision. An investigation and synopsis of the benefits and impediments of directed and solo techniques has been led according to the viewpoints of indicative precision, scope, model appropriateness, and estimation. This paper provides an overview of the related literature on data-driven fault detection in HVAC can be found in HVAC systems and the use of data-driven fault detection in HVAC, AHU, and chiller systems. This paper offers some suggestions and further research directions, such as the development of hybrid FDD approaches, in light of the difficulties in developing data-driven methods.

Keywords: FDD, Data-drive, HVAC, Supervised technique , Unaided strategy.

Introduction:

The construction industry consumes 35% of all global energy¹, while HVAC systems consume 50%–60% of all energy used in buildings². In HVAC systems, a number of components operate below optimal levels³. 261 out of 1251 Variable Air Volume (VAV) terminals in a Hong Kong commercial building were operating abnormally, according to a study by Qin and Wang. Roth et al. found commercial buildings in the United States⁵ discovered that 13 critical failures account for 4-18% of the energy consumed by refrigeration, HVAC, and lighting systems. Energy can be wasted, equipment life can be shortened, the indoor environment can be unpleasant, and many other issues can occur if an HVAC system fails. Poor equipment maintenance, improper component performance, installation failures, and control errors⁶⁻⁹ can all have a negative impact on the effectiveness of HVAC systems

A Simple and Quick Method Based on SPT Results to Calculate the Installation Torque of Multi-Helix Piles in Clayey Sand

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Abstract

The purpose of this study was to develop a method that could quickly and easily determine the installation torque of multi-helix piles, which are frequently used as guy-wire anchors and foundations for transmission line towers in Brazil. In order to accomplish this, an equation was created taking into account the theoretical connection that exists between the installation torque, the pile uplift capacity, and the effect of soil disturbance on the torque that is resisted by the pile shaft and helices during installation. The data from 571 six-helix piles installed in clayey sand sites were used to fit the proposed expression (457 piles served as the training dataset, and 114 piles served as the validation dataset). This study found, among other things, that (i) the measured-to-predicted ratio for the training dataset is 1.00, with a COV of 10.2%, while the measured-to-predicted ratio for the validation dataset is 1.01, with a COV of 11%; (ii) A correction factor based on the average N-value of the soil around the first three tapered helices was used to improve the method's accuracy; (iii) The torque that was obtained using the current method was also in line with the prediction of the installation torque made from additional four-helix pile data, despite being slightly conservative; (iv) A parametric analysis reveals that the area of the helices has a significant impact on the installation torque. Finally, in the event that the installation torque of multi-helix piles is comparable to that of the database, which is typical of Brazil, the method described in this note can successfully predict it.

Keywords: installation torque, multi-helix piles, database, training dataset

Introduction:

A non-displacement pile foundation known as a helical pile implements bearing capacity by affixing at least one helix plate to a hollow shaft that is rotary-poised into the ground. Using a torque machine that directs rotary penetration to a specified depth, the helical pile can be installed with low noise and vibration. This pile can be installed in areas with limited installation space, such as commercial buildings or historic sites, with a relatively small machine. Because helix plates with a diameter larger than the hollow shaft are attached to the helical pile, each helix plate has end bearing capacity, making it superior to conventional steel pipe piles in terms of bearing capacity for material costs [1]. The bearing capacity of helical piles has been investigated in relation to both the hollow diameter and the helix diameter. The majority of helical piles have a standardized shape.

A study on an alternative self-starting generator that makes use of ESS

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Abstract:

ESS is widely used in Korea's FR power system. Instead of using the self-starting generator, we propose in this paper a method for starting the supply generator by activating the transmission line to the ESS when one part of the system is completely out of order. Through the calculation of power flow and transient stability, simulation should be carried out to determine if replacing the self-starting generator with the ESS poses any challenges. For the simulation, we utilized actual KEPCO system data and the CBEST model from EPRI.

KEYWORDS: ESS, backout, self-starting generator, CBEST

Introduction:

Due to rising global demand, particularly in developed and emerging nations, more sustainable energy solutions are now needed to replace conventional energy resources used to generate power, such as fossil fuels [1]. Fossil fuel-based energy sources are to blame for damaging environmental problems including climate change and global warming [2]. In the last several decades, the amount of greenhouse gases released into the atmosphere as a result of electricity production has drastically grown [3]. In order to combat the present environmental problem, Renewable Energy (RE) technologies as solar, wind, hydro, biomass, geothermal, and hydrogen energies have been introduced to create power [[4], [5], [6]]. RE is receiving more and more attention as a result of their ecologically favourable qualities and capacity to produce electricity with zero or practically no production of air pollutants.

Development of an Intelligent Energy Management System with Economic Dispatch from a Standalone Microgrid

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Abstract:

The microgrid concept has been widely utilized for grid-connected distributed energy resources. During grid failures, that can function connected to or disconnected from the main grid. Microgrid operations face new difficulties as a result of this integration. For optimal energy scheduling of these distributed energy resources, an energy management system is therefore necessary. A novel control strategy for optimum energy management and economical microgrid dispatch is presented in this paper. The proposed system's performance is evaluated in three case studies that take into account power balancing, maximizing the utilization of renewable energy, monitoring the battery state of charge, fuel cost optimization, real-time information exchanges, and satisfying the system objective constraints. Typical results are presented with initial state of charge, load profile, and meteorological conditions as variables parameters.

Keywords: Microgrid, distributed energy resources, energy management system, economic dispatch, fuel cost optimization, real time information exchanges, objectives constraints.

Introduction

In this paper, the "recovery plan at all power failure" established and operated at the current power exchange was examined to see how stable the electric power system would be in the event of replacing the original generator with BESS. Due to the position constraints of hydraulic power and pumped-storage power generation, recovery plans that make use of existing self-starting generators have the disadvantage of generating high voltage for an extended period of time using transmission lines. By substituting the original starting and generator, we used BESS to analyze with the expectation of the effect that high speed could shorten the recovery time and reduce it to the time transmission line.

A Linear Switched Reluctance Motor with a Modified Structure for Linear Propulsion of a System

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Abstract:

The dense population of Indian cities necessitates rapid transportation systems. The development of an efficient intercity transportation system is now the urgent requirement as a viable option. Due to its speed of travel, promptness of service, and effectiveness, railway transportation possesses all of the characteristics necessary for contemporary intercity transit systems. Due to the inherent advantages of linear motors over rotary motors used in these systems, linear motor-powered railway systems are gaining popularity among the numerous railway systems available worldwide. The propulsion systems of these transports make extensive use of linear synchronous and linear induction motors. However, linear switched reluctance motors (LSRMs) are the subject of a great deal of research for use in such applications due to their straightforward construction and lower manufacturing and upkeep costs. Nevertheless, this motor's force performance is altered by its nonlinearity. As a result, the Mumbai monorail train system, which was just recently developed, is made possible by a modified structure of LSRM presented in this paper. The actual Mumbai monorail system's rail car specifications are taken into consideration when developing the linear propulsion system. The changed LSRM is intended to meet these determinations and dissected utilizing limited component technique.

Keywords: LSRM, Linear synchronization, transport system

Introduction

Because of the incessant event of worldwide energy emergencies, another energy innovation has been created, the exchanged hesitance engine (SRM). It has numerous application possibilities in contemporary industries, such as the electric vehicle, household appliance, and textile machinery

industries [1,2,3], thanks to its low cost, straightforward structure, simple maintenance, and superior reliability. The twofold striking shaft construction and exchanging control mode cause the profoundly nonlinear and firmly coupled electromagnetic qualities of the SRM, bringing about the issue of enormous force throb when the SRM is running, particularly at low rates. Motor torque pulsation can cause vehicle noise and resonance issues at certain frequencies in electric vehicle applications.

Transient Stability Constraints and Improved PSO for the Best Power Flow **Subhanga Mishra¹ , Sangram Keshari Sahoo²**

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Abstract

Stability is a crucial constraint in power system preventive control against blackouts triggered by transient instability (TS) following a contingency in improved PSO applied to the optimal power flow. In recent years, the Transient Stability Constrained Optimal Power Flow (TSCOPF) has received a lot of attention. By incorporating transient stability constraints into the conventional Optimal Power Flow (OPF) problem, this paper proposes a novel approach to its solution. To address the TSCOPF, the Improved Particle Swarm Optimizer (IPSO) was developed. The Western System Coordinated Council (WSCC) 9-Bus system and the IEEE 30-Bus system are used to test the proposed method. The findings demonstrate that the proposed formulation has significantly improved system stability.

Keywords: Power System Stability, Transient Stability Constrained Optimal Power Flow (TSCOPF), Improved Particle Swarm Optimizer (IPSO), Optimal Power Flow (OPF), Power System Contingencies.

Introduction:

Transient stability in the power system can occur for a variety of reasons, including the occurrence of a fault, an abrupt generator outage, an abrupt line outage, or an abruptly large increase in load. It is significant issue and more dependable to work under stable power framework and stay with providing the electrical energy under these states of transient strength. The generator rotor angle is one of the most crucial indicators in the analysis of transient stability. An increase in the generator rotor angle may result in power system instability. Any delay in clearing the fault by the circuit breaker results in an increase in the generator rotor angle swing and instability [1].

The Optimal Power Flow (OPF) is one of the most important methods for reducing power system instability and increasing transient stability analysis. Optimal Power Flow is a static nonlinear optimization tool for resetting the control variables to satisfy a different equality and inequality constraint while also meeting a minimum objective function. In order to resolve the system's instability, transient stability are utilized as inequality constraints in the state variables of the OPF analysis in this article.

Using Multi Hop Data Aggregation to Increase Energy Exertion in Wireless Sensor Networks

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Abstract:

The multi-hop LEACH, hybrid energy efficient distributed (HEED), and ad hoc on demand distance vector (AODV) protocols are discussed. The sensor is chosen as CH in multi-hop clustering based on the sensor nodes' maximum envelopes position and two parameters. The purpose of the multi-hop LEACH is to alternately select SNs as CHs. The enormous energy consumption required to exchange information between the BSs extends to all sensor nodes in the set of networks. Every node will choose the presence cluster head (CH) based on the minimal packet failure using this sequence. Mat Lab simulations show that when choosing the best communication path, taking into account packet failure has a significant impact on reducing the amount of energy used by the complex network at a time when network throughput is higher than ever.

Keywords—Energy Exertion, Routing Protocols, Packet Failure, Wireless Sensor Networks

Introduction

WSNs are global, self-configuring, self-coordinating networks with no infrastructure that enable air-to-ground data exchange. As microelectronic systems, these networks' nodes are primarily responsible for phenomena identification, local data processing, and data transmission or reception. The four components of the sensor nodes (motes) are depicted in Figure 1 [1]: an energy source, a detecting component, an information stockpiling unit, and a transmitter. With superior authority for external base stations (BSs), they are able to control the number of sensor networks that interact with one another across a larger number of geographical areas. Vehicle communication can be improved by using hybrid cellular networks with a multi-hop VANET and a high volume of information transactions by reducing the median transmission time, reducing packet loss ratios, reducing overhead, and improving packet delivery and efficiency [2].

An Inverted-H Shaped Multiband Fractal Micro strip Patch Antenna for Cognitive Radio Abbreviation

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Abstract:

The purpose of this paper is to present the design and fabrication of an inverted-H-shaped multiband fractal microstrip antenna for spectrum sensing in cognitive radio applications. In order to achieve the desired performance in the frequencies of 1.382 GHz, 2.623–3.101 GHz, 4.628–11.98 GHz, and 13.22–20 GHz, further efforts are made to optimize the proposed antenna using the nature-inspired metaheuristic Moth flame optimization. In accordance with the requirements of spectrum sensing antennas for cognitive radio applications, this antenna features multiple wide bands and a nearly omnidirectional radiation pattern.

Keywords: microstrip, metaheuristic, radiation pattern

Introduction:

Linear switched reluctance machines (LSRMs) and linear electric machines in general are attracting a lot of attention right now. Despite the fact that LSRMs have a force-to-volume ratio that is approximately 60% lower, they are still an appealing alternative to permanent magnet linear motors (PMLM) [1]. On the other hand, they are more robust and have a good capacity for fault tolerance due to the absence of permanent magnets, which also makes them less expensive and simpler to assemble. LSRMs have been proposed for a large number of uses, for example, exact movement control [2], impetus rail route transportation frameworks [3], vertical interpretation [4], dynamic vehicle's suspension framework [5], life-support applications [6], and in direct-drive wave energy transformation [7].

Using a Rough Set Method, Mathematical Modeling for Predicting and Classifying Neonatal Infections

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Abstract

The majority of human contagious diseases affect newborns. Our goal is to provide a prediction for these diseases, which are responsible for millions of deaths. Rough set technique was used to analyze the symptoms of these diseases with the fewest attributes, and a time series model was used to predict which diseases are contagious.

Keywords: AI-Artificial Intelligence, RST-Rough Set Theory, CS-Congestive Science, ML-Machine Learning, KD-Knowledge Discovery, A-Data Analysis, Data Mining and Time series

Introduction

A computational approach for dealing with obscurity and blurriness is RST. For prediction, the TSM statistical method is used. Utilizing DA and DM tools significantly enhances computational information through these methods. Using RST, the evolutionary algorithm can be translated into mathematical approaches through AI and CS, two alternative computational pathways. Lower and Upper approximations, denoted by $(\underline{X}, \overline{X})$ and $(\underline{U}, \overline{U})$, respectively, constitute RST's fundamentals. Our intention is to obtain boundary-related results. The work basically tries to cut down on approximate errors by using the RST technique. Soft computing and statistical analysis are mixed up in this. with the intention of producing accurate predictions [7, 8, 9]

Enhancement of the magnetic flux leakage signals used to detect surface defects on rail tracks

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Abstract:

Non-destructive testing of rails, pipelines, and storage tanks frequently makes use of magnetic flux leakage (MFL) detection. The spillage attractive field (LMF) of a deformity, particularly a little imperfection, is generally frail. An LMF sensor here has ferrite added to it to make it easier to find small rail surface defects by increasing the magnetic intensity above them. Simulated and experimented studies of the effects of ferrite cross-sectional shape and size have revealed the ideal dimensions for signal enhancement. To smother the obstruction brought about by the variety of the takeoff distance, two Lobby sensors are presented and a differential circuit is intended for signal post-handling. It has been demonstrated through experiments and simulations using finite elements that ferrite significantly enhances MFL signals.

Introduction:

The underlying presentation and administration status of rails are vital to the wellbeing of railroad transportation. Consequently, an assortment of non-damaging testing strategies are utilized for deformity recognition], for example, the regularly utilized ultrasonics and swirl current methods. However, the fatigue damage on the rail's surface cannot be detected using the ultrasonic method. In addition, the eddy current method is not appropriate for rapid detection.

THE IMPLEMENTATION OF NONLINEAR FILTERS FOR IMPROVING MEDICAL IMAGES WITH THE USE OF MATLAB

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ABSTRACT:

Despite the significant advancements in medical imaging tools, there are still human errors made during the process of filming medical images. These errors cause distortions in the image and alter some medical image properties that accurately affect the diagnosis of a disease. Clinical pictures are one of the central pictures, since they are utilized in the most touchy field which is a clinical field. Using the most powerful and widely used image processing software, MATLAB, the purpose of the study is to determine how non-linear filters affect the enhancement of medical images. The researcher came to the conclusion that, once the method was put into practice, the median filter—one of the non-linear filters that are implemented with Matlab functions—would produce the best results for medical image enhancement.

Keywords: Enhancement, median filter, noise reduction, maximum and minimum filters, non-linear filters, and so on.

Introduction

Image fusion handles various combinations of sensed images. These sensed images are acquired from a variety of sensors that allow for high and multi spectrum viewing at a variety of angles and resolutions, which improves assessment for achieving image quality. Multi-sensor images are utilized in a wide variety of fields, including computer vision, remote sensing, and medical imaging. Because the multi-model fused image contains more significant information than a single image and is a combining procedure of complement fusion methodologies for clinical assessment, fusion of medical images produces a good informative image for clinical assessment.

Energy Productive Calculation for Remote Sensor Organization utilizing Fluffy C-Means Grouping

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Abstract:

Energy productivity is an imperative issue in remote sensor organizations. An energy-efficient routing algorithm has been proposed in this paper to extend the network's lifespan. The optimal number of static clusters has been created using fuzzy C-Means clustering in this study. To avoid excessive energy loss, redundant data generation and transmission are eliminated using the coherence concept. Intra-group and between bunch doors are utilized to keep away from hubs from sending information through significant distances. For direct data transmissions, a novel strategy has been proposed to select sturdy nodes close to the sink. Based on lifetime, average energy consumption, and throughput, the proposed algorithm is compared to LEACH, MR-LEACH, MH-LEACH, and OCM-FCM. From the outcomes, it is affirmed that the exhibition of the proposed calculation is obviously superior to different calculations and is more appropriate for execution in remote sensor organizations.

Keywords—WSN; clustering; sleep-awake; virtual grids; multi hop; routing

Introduction:

Urban electric power consumption has significantly increased due to rapid industrialization and urbanization (EPC). China's National Bureau of Statistics conducted a survey that found that domestic electricity consumption per person has increased from 515.0 kWh in 2013 to 732.1 kWh in 2019 [1]. EPC is rising as a result of both economic activity and climate change. By 2030, cities must be inclusive, safe, resilient, and sustainable, according to Sustainable Development Goal 11 (SDG 11) [2]. For this objective to be achieved, residents must have access to electricity service facilities. The data foundation for accomplishing this objective is provided by fine-scale accurate and dependable EPC distribution estimation. In this study, EPC primarily referred to domestic use and residents, who were closely linked to the urban economy, population, and living conditions. Momentum metropolitan EPC information for the most part exists as measurable information as authoritative units, which can't address the issue for fine-scale metropolitan manageability research because of coarse goal. As a result, the creation of a method for fine-scale gridded EPC estimation is urgently required.

Energy-Efficient Cluster-Based Fuzzy Enhanced Multicast Protocol for Increasing Network Lifetime

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Abstract:

The sensor node in a wireless sensor network (CWSN) is mobile and can roam both within and outside the network. The best routes for forwarding packets are what present existing models have found to be difficult. It may result in a decrease in the lifetime of the network if the balancing of packet arrivals and energy conservation is not achieved. Fuzzy enhanced Cluster based Energy Efficient Multicast Protocol (FCEEMP) is developed on the basis of three aspects in our research work. The first is multicast routing, which is based on the best route metric and average reliability metric. Second, the cluster is formed by the stability of nodes and their ability to take routes. The cluster network model uses three sets of nodes to estimate energy consumption: the sensor node, the cluster member, and the Cluster Head (CH). Thirdly, an improvement to the fuzzy model is made to get the best energy and the value of the lifetime of the network. Based on the simulation analysis, the proposed protocol outperforms the other schemes.

Keywords:CWSN, Energy consumption, Multicast routing, Fuzzy model

Introduction:

There are a few applications related with Remote Sensor Organization (WSN) to screen the occasions at far area. It has numerous capabilities for advanced processing and high sensitivity thanks to its small sensor nodes. Although a large number of sensor nodes may be required to monitor real-time events, there are limitations, such as limited antenna gain, battery life, and bandwidth. Environmental monitoring, inventory management, volcano tracking, weather monitoring, and biomedical applications are the most common uses of WSN. It consists of three main components in cluster-based WSN: data monitoring, data aggregation, and data reporting to CH. All cluster members (CMs) are managed by CH, who also makes use of the available resources whenever necessary. In addition, CH is in charge of power-related data broadcasting, route selection, packet forwarding, and cluster member monitoring. One important factor in determining the sensor network's lifespan is energy.

A Non-Intrusive Experiment to Examine the Visual Attention Data on Exposure to a Brand Using Eye Tracking

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Abstract:

The purpose of this study is to comprehend how articulation affects sporting event sponsorship posters. To examine the visual attention data on exposure to the sponsor's brand while viewing an advertisement poster, an eye tracking experiment was carried out. Based on what they remembered seeing the poster, the respondents were asked to complete a questionnaire. The Mann-Whitney U test and ANOVA were used to examine the quantitative data as well as the eye tracking data. The convenience sampling method was used to reach respondents between the ages of 20 and 42. The study determined that articulating a sports poster is unlikely to have a significant impact on consumers' visual attention and brand awareness; rather, the articulated text draws attention away from the brand. In addition, the articulation effects of sports posters are influenced by the degree of congruence between the sponsor and the event. When congruence is low, it influences visual attention, leading to a stronger brand recall. The existing literature on the topic of the impact of articulation in sports sponsorship is lacking, but this study adds to it. To get better results, future research could take into account other kinds of articulation, like socio-financial and analogical, and employ new methods, like the Electroencephalogram (EEG) and Functional Magnetic Resonance (fMRI). Considering the influence of ad-design elements on attention and media planning, the purpose of this study was to empirically test the effect of articulation on sports posters.

Keywords: Sports Sponsorship, Eye Tracking, Articulation, Visual Attention, Brand Awareness

Introduction:

The amount of goods and services traded online is constantly growing. B2C e-commerce revenue in Europe rose from 279.3 billion EUR in 2013 to 636 billion EUR in 2019 [1]. The COVID-19 pandemic has exacerbated this trend by altering the demographics of online customers and the frequency with which they make purchases [2]. An increasing number of older people are also making purchases online [2]. In any case, not just clients have changed their buying conduct for web based business, yet the retail area has additionally answered the revised circumstances. Because of the pandemic-related limitations on admittance to shops, fixed retailers began selling their items on the web or broadened their current web-based business [3], and large numbers of them plan to extend their web-based exercises from now on. Because of this, these businesses are directly competing with pure online retailers, who have years of experience with web presence

and are always improving their online stores [4].

Using CNNs pre-trained for audio classification and transfer learning, intelligent fault diagnosis of industrial bearings

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Abstract:

The preparation of Man-made consciousness calculations for machine finding frequently requires a gigantic measure of information, which is barely accessible in industry. Since both tasks require the extraction of features from spectrograms, this study demonstrates that pre-trained convolutional networks for audio classification already have knowledge for classifying bearing vibrations. When rolling element bearings have localized defects, transfer learning is used to transfer knowledge. This method gives a device to move the information implanted in brain networks pre-prepared for satisfying comparative undertakings to symptomatic situations, essentially restricting how much information required for tweaking. Vibration samples were used to fine-tune the VGGish model for the specific diagnostic task. The test bench for medium-sized bearings in the Politecnico di Torino's mechanical engineering labs was used to extract data. There were three damage categories in the experiment. The findings demonstrate that vibration spectrograms can effectively classify the bearing state using the model that has been previously trained with sound spectrograms. Through comparisons to the existing literature, the model's effectiveness is evaluated.

Keywords: sophisticated fault diagnosis; profound learning move learning; bearings that move; rig for bearing tests; monitoring of condition

Introduction:

As part of putting predictive maintenance strategies into action, bearing sensing is used to monitor rotating systems. The cost savings and increased production that these methods bring to industrial rotors motivate their implementation [1]. Bearing fault diagnosis is a major concern of predictive maintenance and condition monitoring for two primary reasons. First, due to the intricate interaction between numerous components, durability evaluations of rolling bearings are impacted by significant uncertainties [2]. Bearings are also well-known to be important nodes for retrieving information about the mechanical system as a whole [3]. One of the most useful methods for evaluating machine conditions in this setting is the analysis of vibration signals [4].

Rotational inertia's effect on the runner radial forces of a model pump-turbine passing through an S-shaped characteristic region

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Abstract:

Pumped-storage power stations (PSPSs) must strictly maintain stability and safety in order to improve the stability and safety of the power grid. However, the S-shaped characteristics of pump turbines cause frequent instabilities in some PSPSs. While the working point goes through the S-formed area, concentrated outspread powers on the sprinter could cause shaft swing of the turbine-generator unit. Using a one-dimensional and three-dimensional coupled computational fluid dynamics model, the runaway transient scenarios of a pump-turbine in a PSPS model were simulated in this study. Additionally, the effect of the unit rotational inertia on the runner radial forces was examined. According to the findings, it is simpler to generate abrupt increases in runner radial forces when the pump-turbine is operating in the S-shaped region with a large rotational inertia than with a smaller one. The explanation is that huge rotational idleness gives more slow changes in rotational speed and release, giving sufficient opportunity to create temperamental and lopsided stream designs in the siphon turbine. This indicates that the running away duration is also necessary for the pump-turbine's transient instability in addition to the running away region in the characteristics plane. The finding is not the same as the conventional understandings and ought to be thought about when chooses the rotational inactivity of a siphon turbine unit.

Introduction:

Due to their bulk energy storage, peak shaving, valley filling, frequency modulation, and phase modulation capabilities, pumped-storage power stations (PSPSs) serve as the regulator and stabilizer of the modern power grid. PSPSs need to be very safe and stable because of these flexible modes of operation and the frequent switching between modes. However, when it crosses the so-called S-shaped region in the four-quadrant characteristics plane [2], the reversible pump-turbine, which is the foundation of the majority of PSPSs, exhibits significant operational instabilities [1]. Numerous PSPS-related issues and accidents, including large hydraulic fluctuations, difficulties synchronizing with the grid, speed surges during turbine startup, power swings in low-head conditions, and draft-tube water column separation during emergency shutdown [3], have been demonstrated to be caused by these characteristics.

Rotor estimator for efficient mesh deformation based on linear geometric algebra

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Abstract:

The creators tackle the issue of assessing the best turn adjusting two arrangements of comparing vectors (otherwise called Wahba's concern or point cloud enrollment). In addition to being robust to noise, accurate, and simpler than the majority of other methods, the proposed method is one of the quickest methods that have been reported in recent literature. The formulation of the problem in Euclidean Geometric Algebra serves as the foundation for solving the linear equations. The authors demonstrate its effectiveness in two ways: the as-inflexible as could be expected (ARAP) surface demonstrating and the more smooth turn improved ARAP network activity which is the main technique fit for twisting surface modes with nature of tetrahedral models. In robotics, automated construction, and games, mesh deformation is an important technique. The ARAP strategy alongside its superior variations, despite the fact that have been widely contemplated, can in any case not be accomplished proficiently. The kernel problem is seen from a new angle thanks to the rotor solution based on linear geometric algebra that this study proposes. This, on the other hand, not only enhances the actual performance of the three-dimensional mesh deformation, but it also offers a brand-new, computationally efficient solution to the Wahba problem and point cloud registration, both of which are closely connected to automation science and engineering.

Introduction:

The emerging requirements of highly dynamic three-dimensional (3D) computer animation, which has been extensively utilized in computer games, visualization, computer aided design, and intelligent manufacturing [1], led to the development of the concept of mesh deformation. Another comparative phrasing, for example the surface straightening has likewise been broadly concentrated on in mechanized development [2]. In theory, these methods aim to make specific 3D models out of 2D meshes. The deformation process takes a long time because complex 3D models have a lot of surface details. The as-inflexible as could really be expected (ARAP, [3]) models such interaction by presenting different nearby unbending changes. This reveals that the mathematical model of ARAP is comparable to the classical problem of point-to-point matching, or aligning two vector sets that may have different numbers of points [4]. In robotics and aerospace engineering, this issue is known as the Wahba's problem [5] and point cloud registration [6]. Numerous robust and computationally efficient algorithms have been proposed since Wahba's problem was proposed in 1965. Shuster, Markley, and Mortari were the first to develop solvers based on quaternions, rotation matrices.

MULTILAYER PERCEPTRON NEURAL NETWORK DESIGN FOR MENTAL TASK RECOGNITION

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ABSTRACT:

A BCI (Brain Computer Interface) is a direct connection between a computer system and the brain's neuronal activity. The BCI's primary objective is to convert brain activity into computer commands. The brain's electrical signals can be recorded with an electroencephalogram (EEG). It is extremely challenging to translate these measured electrical signals from the brain into commands. Signal Pre-processing, Feature Extraction, and Classification are the conversion steps. The computer is controlled by the output of the previous steps. The classification of features is the main focus of this paper. It is based on the BCI Competition III 2008 dataset and uses a Multi Layer Perception Neural Network (MLP) with back propagation training. There are ten units in the input and hidden layers of the proposed neural network, with one unit in the output layer. When compared to other architectures of neural networks, this one has a very low Mean Square Error (MSE) of 0.342 after being trained on the given dataset. With 100% training accuracy and 74% testing accuracy, the proposed method worked.

Keywords: Multi-Layer Perception Neural Network, Brain-to-Computer Interface.

Introduction

Various applications in cognitive science and healthcare have made extensive use of EEG classification signals. Brain computer interface (BCI) research, applications in neuroscience and neuro cognition, and the classification of mental tasks are all examples of this. Subject-dependent mental task classification is an efficient use of EEG to classify mental tasks while subjects are known and available. Additionally, subject-independent mental task classifications are being examined by researchers. Analyses of the effects of diseases on brain function suggest BCI for paraplegics because EEG plays a crucial role in establishing interaction between various areas [1,2]. The BCI is based on computational inferences and recorded EEG signals from brain activity. Researchers have developed new frameworks for analyzing the changes in the brain functioning of patients during treatment [3] with the upcoming accurate EEG data collection techniques. Along these lines, future examination of BCIs for individuals with wellbeing arrangements depends on EEG flags that assist them with using existing mental and engine capacities to direct the framework [4,5]. The patient would be able to control and eventually operate support systems like wheelchairs and artificial limbs with this.

ENHANCEMENT OF HIGH DATA RATES IN WIRELESS COMMUNICATION NETWORKS WITH THE USE OF MIMO-OFDM TECHNOLOGY

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Abstract:

Wireless communication systems necessitate an increase in speed, robustness, and spectral efficiency. A technique for encoding digital data on multiple carrier frequencies is orthogonal frequency-division multiplexing (OFDM). Utilizing Multiple input and multiple output (MIMO), or multiple antennas at the transmitter and multiple antennas at the receiver, the spectral efficiency will increase, making OFDM a popular scheme for wideband digital, whether wireless or over copper wires. It is used in applications like digital television and audio broadcasting, DSL broad band internet access, wireless networks, and 4G mobile communications. OFDM significantly reduces receiver complexity by transforming a frequency-selective channel into a set of parallel flat channels for broadband communications. In this paper, we applied Space-Time Coded Various Info Different Result OFDM (STC MIMO-OFDM) idea for spreading the communicated images. In the proposed frameworks, a multi-layered variety, including time, recurrence, space and tweak varieties, can be utilized, bringing about better piece blunder execution in AWGN channel for with and without cushioning as well concerning with and without convolution coding.

KEYWORDS:OFDM, STC, MIMO, BER, PER, AWGN.

Introduction:

The beginning of remote interchanges dates got back to the past due nineteenth 100 years, while M.G. Marconi did the spearheading compositions of setting up the essential a triumph radio hyperlink among a story station and a towing boat. Structures for wireless communication have improved dramatically since then. Over the past few decades, the number of people who subscribe to cellular services has significantly increased. Globally, the number of cell phone users has increased from a few thousand at the beginning of the 20th century to approximately 1.5 billion in 2004 [1]. With the capability to provide high-quality, high-speed data transfer between portable devices located anywhere in the world, wireless communications is an unexpectedly expanding segment of the communications industry. Since the 1960s, research has focused on the hypothesis that the convergence of a number of factors contributed to the quality

improvement of the wireless conversation era. First, there is a growing demand for wireless connectivity.

Analysis of Alternative Techniques and Solutions to Boost Massive MIMO's Energy Efficiency

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Abstract:

The stormy development of high information rate applications prompts more energy utilization in remote organizations to fulfill administration quality. As a result, the limited availability of energy resources and the operation of environmentally friendly transmissions have received more attention in energy-efficient communications. There are numerous publications in this field that concentrate on improving the energy efficiency of uplink-downlink transmission networks. Using linear precoding schemes, altering the number of antennas per BS, formulating power control problems, antenna selection schemes, and taking into account cell-free (CF) Massive-MIMO are all methods of accomplishing this. Despite reviewing these methods, there are still numerous obstacles to their practical application. This review's strategies demonstrate EE's performance under the aforementioned schemes. The central commitment of this work is the relative investigation of how Gigantic MIMO EE performs under the foundation of various techniques and designs and the answers for not many issue definitions that influence the EE of organization frameworks.

Keywords: EE, Transmission from uplink to downlink, Control of power, Straight Precoding, CF Massive MIMO.

Introduction:

Since Guglielmo Marconi first demonstrated radio's capacity to maintain constant contact with ships navigating the English Channel in 1897, the ability to communicate with individuals who were moving had significantly advanced. Thus, high level remote correspondence administrations and their strategies have been enthusiastically embraced by individuals around the world. Especially in the beyond a decade, versatile correspondence industry has been elevated in greatness, charged by computerized and RF circuit creation upgrades and other shrunked advancements, making convenient radio hardware nanoscopic, prudent, and more credible. When LTE was first introduced, roughly ten years ago, there were only a few tens of megabits of capacity available to all sector users.

Fuzzy C-Means Clustering-Based Energy-Efficient Algorithm for Wireless Sensor Network

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Abstract:

Energy efficiency is an essential consideration in wireless sensor networks. An energy-efficient routing algorithm has been proposed in this paper to extend the network's lifespan. The optimal number of static clusters has been created using fuzzy C-Means clustering in this study. To avoid excessive energy loss, redundant data generation and transmission are eliminated using the coherence concept. The purpose of gateways, both intra- and inter-cluster, is to prevent nodes from transmitting data over significant distances. For direct data transmissions, a novel strategy has been proposed to select sturdy nodes close to the sink. Based on lifetime, average energy consumption, and throughput, the proposed algorithm is compared to LEACH, MR-LEACH, MH-LEACH, and OCM-FCM. The findings confirm that the proposed algorithm performs significantly better than other algorithms and is better suited for use in wireless sensor networks.

Keywords—WSN; clustering; sleep-awake; virtual grids; multi hop; routing

Introduction

Because of touchy interest for remote correspondence during the last ten years, more extensive range assets are required. Notwithstanding, range assets are restricted and are designated by a decent range task strategy. Mitola first proposed the idea of sensing the spectrum [1] to address the issue of spectrum scarcity highlighted in the Federal Communication Commission report [2]. The objective is to detect recurrence band and use that band, assuming that the authorized client called an essential client (PU) isn't utilizing it. In this manner, the location execution in the range detecting is critical to the presentation of the two Discharge and the sensor organization. The location execution cannot entirely settled based on two measurements: the probability of detection is the probability of a sensor declaring that a PU is present, given that the spectrum is in fact occupied by the PU. The probability of false alarm is the probability of a sensor declaring that a PU is present when the spectrum is actually free. It is typically necessary for optimal detection performance that the probability of detection be maximized subject to the constraint of the probability of false alarm due to the fact that the detection prevents interference with the PU and a false alarm decreases the spectral efficiency.

A review on Text Generation using Natural language processing

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Abstract:

The big challenge towards recently applications at natural language processing domain is text generation. Understanding text also considered as a challenge, but its generation is more difficult than analysis. Because of the internationality progression of electronic interaction among people, the researches in text generation became a necessity. It is nice to enable websites, whatever its purpose, to response towards people via natural text. This article is a survey on natural language text generation mechanisms for the period of last two decades and up today. It will be shown that the deep learning mechanisms are the most commonly one. Also it will be shown that transforming deep learning to be self-attention and knowledge understanding is the right way to be continued in domain of text generation.

Keyword: Natural language processing; Human language generation; Text generation; Linguistic grammar techniques; Machine and Deep learning techniques.

Introduction:

The text does not have a solid idea. It is constantly evolving in tandem with the development of text distribution and publishing technologies. Texts were typically presented as printed matter in bound volumes, such as books or pamphlets, in the past. According to linguists David Barton and Carmen Lee, texts are now more likely to be encountered in digital environments, where materials are becoming "more fluid."Text phonetics is a field of study where messages are treated as correspondence frameworks. The analysis examines stretches of language that go beyond a single sentence and places a special emphasis on context—information that is related to what is written and said. The social relationship between two speakers or correspondents, the setting in which communication takes place, and nonverbal information like body language are all examples of context. This contextual information is used by linguists to describe a text's "socio-cultural environment."

Design Theory Framework for Solar Desalination Processes in Mechanical Engineering: A Survey and Meta-Examination

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Abstract:

The present investigation aims to evaluate the theoretical and practical evaluation of solar desalination-related scientific publications. Within the framework of mechanical design theory, this analysis is proposed. The scientific publications of various specialties dealing with the design process of solar desalination were analyzed using inductive and statistical techniques for this purpose. A trend that justifies applying the study's findings to these kinds of devices of the analyzed approaches to the theory of mechanical design was obtained through the use of the aforementioned methods. Quantitative and analytical statistical analysis are used in the above evaluation. This answers questions about how mechanical design theory can be applied to this kind of solar desalination by connecting various fields of study that are currently used separately, as posed by various authors.

Keywords: Desalination, mechanical design, meta-analysis, solar energy, functional modeling, design representation, and humidification-dehumidification are some of the key terms

Introduction:

Due to the pressing need to address global water shortage issues and the depletion of conventional energy sources previously used to obtain water in various scenarios, interest in the application of renewable energies, such as solar energy, to produce fresh water has increased. In particular for isolated locations where a traditional energy supply is not readily accessible, the utilization of renewable energy sources in water desalination is of interest [1].

It is also possible to use solar thermal energy with a power cycle to generate direct mechanical power. Thermal distillation technologies such as vapour compression, multi stage flash, solar still, and multi effect distillation, as well as membrane processes such as reverse osmosis, forward osmosis etc.

Power Profile Analysis-Based Lightweight PUF-Based Gate Replacement Technique to Reduce Information Leakage

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Abstract:

Delivering a secure design and protecting the system from attackers and malicious modules known as Hardware Trojans is the most difficult task for designers of electronic devices. Even though the device is protected by a number of cryptographic safeguards, adversaries discover new ways to harm it. The Differential Power Analysis (DPA) attack is a type of Side Channel Attack in which an attacker uses power leakage analysis to extract the circuit's functionality. To beat this, a lightweight methodology is proposed in this paper utilizing, Wave Dynamic Differential Rationale (WDDL) strategy, without causing any extra asset cost and power. By limiting leakage power, the primary goal of WDDL is to keep a circuit's power consumption constant. An alternative approach taken by an adversary is to leak the data by reverse engineering it. Using a bit sequencer and a modified butterfly PUF-based randomizing architecture, the proposed work avoids this. In addition, a reworked version of the butterfly PUF is proposed in this paper. Numerous qualitative tests have demonstrated that this PUF is capable of preventing information leakage. The results of this work's validation on ISCAS 85 and ISCAS 89 benchmark circuits show that the difference in leakage power is very small.

Keywords: Equipment Security, PUF, TRNG, Logic.

Introduction:

In this decade, a major focus of research has been developing secured hardware for overcoming circuit vulnerabilities. The use of integrated circuits (ICs) has significantly increased in tandem with the steady advancement of technology. An IC's design and manufacturing are becoming public due to its globalization [1] [2]. Many outsider organizations will privateer the genuine plan of IC and recreate something very similar with minimal expense. At various stages of the IC's production, attacks can be launched. There are suggested countermeasures to keep the IC safe from malware attacks. Watermarking, finger printing, obfuscation, and metering are some of the proposed countermeasures [3]. Even though these safeguards shield an IC from 3PIP attacks, there are still ways for an adversary to compromise the design's functionality. The side channel assaults comprise of various boundaries like power spillage, delay, temperature examination and timing investigation. The attacker can extract the functionality or spots in the circuit where the delay is occurring using delay analysis [4]. Authors are affiliated with the Department of Electronics and Communication Engineering at the Amrita School of Engineering in

Coimbatore. Amrita Vishwa attempted to insert malware that alters the circuit's functionality.

KFOA: K-mean Clustering, Firefly Based Data Rate Optimization, and ACO Routing for Congestion Management in WSN **Debasis Mishra¹ , Niranjana Mishra²**

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Abstract — Remote sensor organization (WSN) is collection of sensor hubs capable in ecological data detecting, refining it and communicating it to base station in sovereign way. The environment is sensed and monitored by the minute sensors, which communicate with each other. The limitations of processing power, communication range, and bandwidth are the primary obstacles. The primary obstacle in designing an energy-efficient network is the power source of these sensor nodes. Using a swarm intelligence approach, the proposed clustering and data transmission algorithm aims to improve network performance. This method depends on K-mean based bunching, information rate advancement utilizing firefly enhancement calculation and Subterranean insect province improvementbased information sending. The KFOA is broken up into three sections: 1) Using the K-mean technique to cluster sensor nodes, optimizing data rates to control congestion, and using the shortest path for data transmission based on the ant colony optimization (ACO) technique Two scenarios—with rate optimization and without rate optimization—are used to analyze the performance. The first scenario includes two operations: ACO-based routing and kernel clustering. According to KFOA, the second scenario consists of three operations. Throughput, packet delivery ratio, energy dissipation, and residual energy analysis are used to assess performance. The re-enactment results show improvement in execution by utilizing with rate streamlining strategy.

Keywords — Clog control, WSN, rate reduction, clustering, routing

Introduction:

The wireless sensor network is a collection of numerous small, low-cost, and autonomous sensor nodes. The Tran receiver system, memory unit, and power supply are all present in the nodes. Bandwidth, processing speed, storage capacity, battery life, and other resources are scarce. The primary capability of these sensors is to hoard the information from climate and communicate it to one of strong base station. Medical, industrial production units, vehicle traffic management, structural monitoring, and habitat control are just a few of the many uses for WSN. On the identification of occasion all sensors covering detecting scope of occasion spot start synchronous information transmissions towards sink hub. Data packets collide as a result of this process, and the network experiences congestion as a result of buffer overflow.

High Performance Computing Model for Real-Time Online Credit Card Fraudulent Identification Using ESVDS and SPSO

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Abstract:

Current advancements in the communication over networks and e-commerce section have led to considerable raise in the usage of credit cards for all type of transactions, including those conducted online and even in traditional stores. But duplicitous credit card communications have steadily increased, causing commercial institutions to lose a lot of money on yearly basis which reduces the turn-over. The creation of efficient fraud detection techniques is essential to minimize these losses; yet, doing so is difficult as it is extremely uneven in nature because of the majority of credit card datasets. Furthermore, utilizing traditional data mining algorithms for credit card fraudulent revealing is ineffective owing to its architecture, which entails a fixed mapping of variables from input sets with the output set of vectors. Using a Ensembles of Neural Network (NN) classifiers and hybridized information re-sampling strategy, this research presents a scheme that is both effective and efficient for identifying fraudulent use of credit cards. The ensemble classifier is produced using Enhanced Support Vector Data Sphere (ESVDS) and Stochastic Particle Swarm Optimization (SPSO) model as the basic learner in the cat boosting strategy. By combining the SMOTE-Synthetic Minority Oversampling Technique with the Edited Nearest Neighbor (ENN) technique, the hybrid re-sampling is accomplished. Proposed model overtakes other algorithms in experiments using data from Brazilian banks and UCSD-FICO.

Keywords:Catboost; credit card; data imbalance; ensemble learning; risk analysis; meta-heuristics

Introduction:

Machine learning is currently used extensively in portfolio management, trading, risk analysis, fraud prevention, and detection in the banking and financial sectors. Machine learning is used to create Chatbots, artificial intelligence software that can interact with customers and answer their questions, for instance, in the financial industry. In exchanging, Choice Exchanging Emotionally supportive networks or Algorithmic Exchanging, is utilized topursue very quick choices [4]. In addition, fraud prevention is one of the primary applications of machine learning in the banking sector.

A Memristor-based Sub-threshold SRAM Cell with Low Leakage

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Abstract:

With the idea of sub-threshold operation, this work aims to improve total power dissipation, leakage currents, and stability without affecting the logic state of a SRAM cell. However, while sub-threshold SRAM proves to be advantageous, it fails to match the readability and writability of a standard 6T SRAM cell. In this paper, we looked into a non-volatile 6T2M sub-threshold SRAM cell with six transistors and two memristors that operates at a lower supply voltage of $V_{DD}=0.3V$. The memristor is used to store data even during power failures and restores previous data with successful read and write operations, overcoming the problem. In addition, a new configuration of the non-volatile 6T2M (6 Transistors & 2 Memristors) subthreshold SRAM cell is proposed in this paper. This new configuration results in improved power, stability, and leakage current behavior, with read and write power increasing by 40% and 90%, respectively, when compared to the conventional 6T2M SRAM cell. The proposed 6T2M SRAM cell offers great security of $RSNM=65mV$ and $WSNM=93mV$ which is significantly better at low voltage when contrasted with customary fundamental 6T SRAM cell, and further developed spillage current of 4.92nA is accomplished as looked at.

Keywords: Six terabit SRAM cell, memristor, dissipation of power, peruse and compose activity, a current leak, stability, non-unstable circuit.

INTRODUCTION:

L.Chua theoretically demonstrated the introduction EMIRSTOR in 1971[1] as the fourth passive circuit element, after the resistor, capacitor, and inductor. It was physically manufactured in 2008 using a TIO₂ nanoscale device in HP labs [2]. Memristor is a strong candidate for future low-power applications because of its non-volatile properties, good scalability, low power consumption, high package density, and most importantly, its ability to integrate with existing CMOS technologies[3]. One of the most significant aspects of the most recent studies on battery-operated portable devices [3] is power-conscious design methodology. Because unwanted power dissipation raises the temperature of the device, increasing the likelihood of failure and reducing the lifetime of circuitry, mobile applications require and demand low power consumption and leakage current as technology advances [4]. Thusly, scaling of supply voltages saves dynamic as well as spillage power. It is difficult to reduce SRAM cell power consumption for low-power applications.

Recommended Wroclaw Locations with Studio and Home Conditions for Radio

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Abstract:

In October 2018, Wroclaw's agglomeration received coverage from local digital radio. Numerous tests, including qualitative ones involving speech and music, were needed to carry out this project. This paper presents the aftereffects of abstract tests in light of the assessment of discourse nature of signs recorded at different places in Wroclaw. The measurements were carried out in listeners' homes under normal acoustic conditions and in accordance with the recommendations of the International Telecommunication Union. The rating was made for male and female voices. The main end is that for discourse signal appraisal in significance of the quality the test conditions don't impact the got results. The experiment also demonstrated that the receiving location of the DAB+ signal in the Single-Frequency Network has no effect on the perceived quality of the voice.

Keywords: Digital Audio Broadcasting, talk quality, assessment of quality.

Introduction:

On October 1, 2013, Poland began receiving regular broadcasts from Digital Audio Broadcasting (DAB +). As indicated by the suggestions of the European Telecom Association (EBU), advanced radio inclusion ought to cover both enormous regions (the whole district/country) and more modest, for instance metropolitan agglomerations [1,2]. On January 19, 2018, a neighborhood Touch + multiplex was sent off in Wroclaw, created as a component of a task did by the Wroclaw College of Science and Innovation, the Correspondences Organization in Wroclaw and Clean Radio Wroclaw. In the DAB + digital radio system, the solution was implemented as a Single Frequency Network (SFN). The much better utilization of spectral space is the primary benefit of this kind of network. Using the gap filling technique, a network of multiple transmitters operating at the same frequency, transmitting the same signals, and meeting the relevant synchronization requirements can cover a much larger area and minimize total radiated power [3].

A Review on Pothole detection using Image Processing

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Abstract:

Accidents caused by uneven road conditions can harm drivers, passengers, and pedestrians. Monitoring the state of the roads is essential to creating a network of safe and enjoyable mobility. Road accidents are affected by a number of variables, including speeding, reckless driving, and poor road conditions. Accidents that happen through no fault of the motorist happen rather frequently. One of the main contributing causes to these incidents is bad road conditions. Due to the rising number of potholes, accident rates are rising year after year. Because road maintenance is typically performed manually, it takes a long time, involves effort, and is prone to human mistake. Since potholes are one of the main cause of accidents, it is crucial to identify and categorise them using image processing techniques. On roads and highways, potholes are areas of uneven pavement that are caused by continual automobile traffic as well as environmental factors. A system for measuring pothole size and detecting them is suggested. To find potholes, the suggested solution employs a deep learning- based YOLO (You Only Look Once) algorithm. By utilising image processing, the system offers a practical cost-effective solution for pothole detection on the road and notifies the responsible party for road maintenance. A report is also generated capturing the number of potholes and evaluating its area and depth. The method makes use of a specially created dataset that includes pictures of both dry and wet potholes of varying sizes and shapes.

Keywords: YOLO, Deep Learning, Image Processing, Pothole Detection

Introduction:

A pothole, also known as a kettle or chuckhole in some parts of the Western United States, is a type of disruption in the surface of a roadway caused by a portion of the road material breaking away to form a hole. Most potholes are shaped because of an exhaustion of the street surface. Crocodile cracking is a pattern of interlocking fatigue fractures as they develop. Between fatigue cracks, pieces of pavement are worked loose and may eventually be pulled off the surface by continued wheel loads, resulting in a pothole. Low temperatures make it worse for potholes to form because water expands when it freezes to form ice, putting more stress on a road or pavement that is already cracked.

AH Method: a Novel Routine for Examining the Optimum in the Neighborhood of a Genetic Algorithm

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Abstract — The paper presents an original heuristic technique (further called the AH Strategy) to research capability shape in the immediate area of the tracked down ideal arrangement. The study is led utilizing just the space testing gathered during the advancement interaction with a developmental calculation. For this reason the limited model of point-set is thought of. The factual examination of the testing quality in light of the inclusion of the places being referred to over the whole fascination locale is taken advantage of. The resistance limits of the not entirely settled for the client determined increment of the goal capability esteem over the viewed as least. The introduced experiment information demonstrate that the proposed approach is equivalent to other ideal neighborhood assessment calculations. Additionally, the AH Technique demands observably more limited computational investment than its partners. This is accomplished by a rehashed, second utilization of focuses from enhancement without extra goal capability calls, as well as huge vault size decrease during pre-processing.

Keywords— heuristics, developmental calculations, hereditary calculations, vulnerability assessment.

Introduction-Transformative calculations are advanced worldwide improvement methods. A wide range of ways to deal with this subject have been planned since the conventional procedure of simultaneous looking for the ideal arrangement was initially proposed by Holland [1]. Different methods include blends of room investigation and double-dealing of recently uncovered fascination areas. The inquiry interaction is performed by handling a bunch of up-and- comer arrangements, called a populace. During this activity an immense number of goal capability values are determined for various places in the hunt space.

Rapidly developing ladder: A schematic for a programmable logic controller used in a technological process framework as a contact stepping stool.

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Abstract:

The article provides a developed method as well as general principles for the creation of ladder diagrams, which are frequently utilized in programmable logic controller (PLC) systems. Stepping stool charts are made for consecutive control frameworks of mechanical cycles, which are portrayed by an association design, and time graphs of the chief components' activity. The leader components are twofold acting pneumatic or water-powered actuators constrained by bistable electro-valves. An approach to sequential system design that makes it possible to construct an electro-pneumatic ladder system is presented. There are two sections to the ladder diagram. One is in charge of controlling the valve coils, and the other is in charge of putting the memory block into action. The signals that are described on the boundaries of the graph division are the ones that control the transition to the next state. Festo's computer-aided program FluidSim was utilized for control system synthesis and verification.

Keywords- Synthesis, validation, sequential systems, diagrams of ladders

Introduction:

In device design, the analysis and synthesis of the device's schematic diagram is a crucial issue. In the combination of computerized [1,2,3] and simple [4,5,6,7] electrical frameworks, a numerical depiction is required, which is frequently convoluted. A method for the synthesis of sequential circuits has been presented to meet designers' expectations regarding the minimization of mathematical apparatus in circuit analysis. The synthesis of a sequential system with the use of logical elements is presented as a continuation of the research problems announced in the article [8]. The article provides an example of a selected sequence of executive components of a technological process as a basis for the quick design of a ladder diagram for a PLC controller. The connection pattern and cyclogram, which display the states of the actuators, are shown in the automatic machine's work cycle. The automaton graph was constructed on their foundation.

A Review on Know Your Customer (KYC) System Using Blockchain Technology

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Abstract:

Know Your Customer (KYC) is a crucial process that banks and other financial institutions must undertake before providing any financial services. This involves collecting and recording customer information during the onboarding process, and ensuring that this information is kept up-to-date. KYC is typically integrated into account opening forms and is mandatory for customers to provide accurate information. Almost all financial institutions involve getting KYC information from their prospective customers, from banks to insurance companies. The primary objective of this process is to identify and prevent fraudulent activities like money laundering, identity theft, terrorism financing, etc. However, the cost of managing KYC per customer can be substantial due to a lack of transparency, mistrust, and data duplication. Blockchain technology provides a solution to establish trust and transparency by creating a self-sovereign and Decentralized Know Your Customer (DKYC) model. This model enhances customer privacy through consent-based access, features regulator governance, and helps banks to use trusted and accurate customer data while reducing customer acquisition costs.

Keywords:Blockchain, Know-Your-Customer, Decentralized

Introduction:

Financial market innovation is likely to come primarily from blockchain technology. It considers the making of unchanging records of exchanges open by all members in an organization. A blockchain database is made up of several blocks that are "chained" together by referring to the previous block in each block. One or more transactions, which are basically changes in the listed owner of assets, are recorded in each block. Through a consensus mechanism, members of the blockchain network confirm that transactions are valid before adding new blocks to the existing chain. Blockchain technology can be used to create a network that is "fully peer to peer, with no trusted third party," such as a government agency or financial institution.¹ Although all of these applications are still in the early stages of development, many of them look promising for the financial markets. The bitcoin environment addresses the biggest execution of blockchain innovation to date.² Interest in the innovation keeps on filling in the monetary innovation and more extensive monetary administrations networks..

C-shape Slotted MSPA Analysis for 5G Sub Band Applications on Three Different Substrates

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Abstract: A compact planar square patch microstrip multiband antenna on three distinct substrates is the subject of a proposed comparative analysis. The square radiating part of the proposed design has an etched C-shaped slot, and a microstrip feed line powers the antenna. For simulation analysis, RT Duroid ($r = 2.2$), Taconic ($r = 3.2$), and FR4 ($r = 4.4$) substrates are utilized. The progression of current is altered by the C-molded space making the receiving wire to resound at 3/4 and 6 groups for RT Duroid/Taconic and FR4 substrates individually reasonable for 5G sub GHz applications. The antenna has a small size of 32 x 32 x 1.6 mm³ and a return loss, S₁₁, that is less than -10 dB at all resonating frequencies on all three substrates. The examination has been finished by thinking about the S₁₁ (Return misfortune <-10 dB), Directivity, Receiving wire Gain, VSWR and surface current appropriation. The parameters of various substrate materials are compared in Table II.

Keywords—C-shape, Duroid, RT, The Taconic FR4

Introduction:

The use of small-cell and Internet of Things devices has increased, which has led to more traffic. 5G technology has replaced the current network, requiring more capacity, faster data rates, and extremely low latency. 5G is a cutting edge versatile correspondence innovation that gives more noteworthy limit and information speeds than the past age Long haul Development innovation (LTE) [1]. The rapid advancement of autonomous vehicle technology has sparked a lot of interest in vehicle-to-everything (V2X) communication systems. As part of the connected car system, there has been a significant increase in the demand for automobile antennas for the LTE and 5G communication bands [2]. Various methodologies for accomplishing multiband radio wire setup have been proposed in the writing, including openings [3-7], fractals [8], clusters [9], etc. Different substrate materials have been considered to examine the impact of dielectric material on receiving wire execution.

2x2 Micro Strip Circular Patch Antenna Array at 28 GHz for 5G Mobile Station Application: Design and Simulation

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Abstract:

This paper proposes the design and simulation of 2×2 circular patch antenna array working at 28 GHz by using four inset feed micro strip circular patch antennas to achieve beam forming with directivity around 13dB which is required to overcome part of high path loss challenge for high data rate mm-5G mobile station application. Four element 2×2 array consists of two 1×2 circular patch antenna arrays based on power divider and quarter wavelength transition lines as a matching circuit. The designed antenna array is simulated on RT/duroid 5880 dielectric substrate with properties of 0.5mm thickness, dielectric constant $\epsilon_r=2.2$, and tangent loss of 0.0009 by using Computer System Technology (CST) software. The performances in terms of return loss, 3D-radiation pattern is evaluated at 28 GHz frequency band. The design also includes the possibility of inserting four identical 2×2 antenna arrays at four edges of mobile station substrate to achieve broad space coverage by steering the beams of the mobile station arrays.

Keywords: patch; 5G; return loss; dielectric; array; divider; substrate; directivity; bandwidth

Introduction- The recent years, a huge number of smart devices and sensors providing big amount of information is increasing rapidly due to the presence of several Information Technology fields (IT) such as Artificial Intelligence (AI), and Internet of Thing (IoT). Beside this the number of smart phones, tablets, etc is increasing also to support existing services as internet, music, gaming with high quality. This tends to huge data content hence high data rate information ($> 10\text{Gbit/s}$) is required which do not match as well today's access wireless mobile networks (3G,4G mobile system). The new generation 10 Gbit/s-mm-5G mobile communication system is proposed to support such high data services. To transfer such high data rate through 5G system the RF frequency band must be higher at least three times than the data rate, therefore the RF frequency band This work was supported by GigaNet ISP Company.

Agricultural Use of Renewable Energy Sources: An In-Depth Look at the Past Three Years

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Abstract:

The use of renewable energy as a means of supplying the agricultural sector with energy is growing. Concern for the environment is on the rise right now. Because of this, technology has improved how energy is used in relation to natural resources and how readily available they are for all productive industries, including agriculture. The primary goal of this work is to conduct bibliometric analysis and examine global scientific advancements in renewable energy and agriculture over the past three years (2014–2017). This study aims to provide a summary of the past three years' research on the subject in order to assist the international scientific community, particularly in fostering collaboration among authors, institutions, and nations. The five main clusters of this study were identified through a keyword analysis that utilized community detection. The majority of the keyword analysis was devoted to the following subjects: sustainable power advancements in agribusiness, bioenergy, reasonable farming, biomass energy, and the ecological effect of horticulture. India, China, the United States, Italy, the United Kingdom, Poland, Indonesia, Germany, the Russian Federation, and Spain are the primary nations found to be conducting research on renewable energy and agriculture.

Keywords: sustainable power; agriculture; Scopus; bibliometric; sustainable progress

Introduction:

The UN's 2030 Agenda for Sustainable Development was approved in 2015. To accomplish a natural change in outlook, the 2030 Plan distinguished energy maintainability as a critical component for guaranteeing the suitability of the worldwide monetary framework. The 17 Sustainable Development Goals [1] are the UN's goals. Objective seven alludes to energy manageability, which plans to "guarantee admittance to reasonable, secure, economical and present day energy".

IoT clustering protocols for agricultural precision

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Abstract:

The Internet of Things (IoT) has made it easier to use Wireless Sensor Network (WSN) technologies in new applications. IoT can play a significant role in enhancing production, quality, and output yield in agricultural monitoring. Many agricultural activities will see significant improvements as a result of the use of WSN and data mining methods. The management of the amount of water in planted fields is one such activity. Additionally, WSN has evolved into a more dynamic area of precision farming in recent years. The use of energy and increasing the life of the nodes are the most significant issues in the development of WSN. The clustering protocols based on soft computing that are utilized in the agricultural sector to extend the lifespan of WSNs are the subject of a systematic analysis in this paper. Different soft computing methods are used for classification: genetic algorithm, fuzzy logic, swarm intelligence, and neural networks. The survey will then present a comparison of soft computing techniques, focusing on their objectives and advantages and disadvantages. The findings of this survey enable the researchers to select the appropriate soft computing method for WSN-based precision agriculture clustering protocols.

Keywords:Internet of Things (IoT), Wireless Sensor Network (WSN), Swarm Intelligence, Genetic Algorithm, Precision Farming, Neural Network, Soft Computing

Introduction

Remote sensor organization (WSN) advancements have quickly evolved throughout the long term. Motes or sensor nodes are pervasive devices that can be used to monitor ecological phenomena over a large area. Numerous sensors, processors, and radio frequency (RF) modules make up battery-powered WSNs. The sensor hubs or bits can impart remotely through a correspondence interface and forward their information to a base station or facilitator hub by speaking with a passage. WSNs are able to monitor a wide range of environments in order to obtain precise information from the field because the communication between sensor nodes is dependent on the merging of various sensors, which range from simple (such as humidity, pressure, and temperature) to complex (such as localization, tracking, micro-radars, and images) sensors [1]. As a result, sensor nodes' capacities for sensing, storing, processing, and communicating have continuously increased [2].

Overflow Based Non-Straight Feed forward Brain Organizations for Bi-Directional Memory

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Abstract:

In this day and age, proficient calculation is the way to outcome in many fields. Pattern association influences learning and memory, among other aspects of life. Neural networks successfully demonstrated bidirectional associative memory in complex dynamics. However, there are performance issues with these neural networks, such as computational time. The background of this study was analyzed using a matrix of varying sizes and a random bipolar input and output pattern. Nonlinear memory association is thought to be the most practical approach for dealing with the difficulties presented by bidirectional associative memory. A non-linear feed forward cascade-based neural network that performs pattern association in two passes and resembles a Bayesian algorithm is the subject of this investigation. An irregular example and English letters in order with various examples have been utilized to approve the consequences of this methodology. The study looked at BAM's equivalent performance, pattern association, and stability using the results of the experiments.

Keywords: Cascade Feed Forward Neural Network ,Bidirectional Associative Memory ,Memory Association ,Pattern Recognition

Introduction:

The entorhinal cortex (EC), dentate gyrus (DG), cornuammonis (CA1, CA2, and CA3), and subiculum (SUB) complex are all components of the extended hippocampal formation (HF). Conventional chemical tracing was used in a lot of the groundbreaking research on hippocampal connectivity [1–5]. Traditionally, the HF has been described as having a unidirectional, feedforward circuit organization [6–8]. According to the trisynaptic pathway model, the CA1 sends excitatory information from the hippocampus to the SUB, which has traditionally been thought of as the second major output stage of HF [8–11]. Noncanonical HF circuits have been discovered using novel viral genetic circuit mapping methods, despite the well-established canonical HF connectivity.

Utilizing an integrated particle swarm optimizer, weight minimization of truss structures with sizing and layout variables

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Abstract

The integrated particle swarm optimizer (iPSO) algorithm's effectiveness in optimizing the layout and size of truss structures is the subject of this investigation. Utilizing both the improved fly-back approach to deal with optimization constraints and the concept of weighted particles, the iPSO improves the standard PSO algorithm. A variety of well-known truss structure weight minimization problems, including mixed design search spaces (with both discrete and continuous variables) under a variety of constraints (such as nodal displacements, element stresses, and buckling criterion), are used to evaluate the effectiveness of the most recent algorithm. When it comes to solving problems involving both layout and size optimization, the outcomes demonstrate that the proposed method is appropriate.

Keywords: Combined sizing, particle swam optimizer, and structural optimization

Introduction:

One of the most significant areas of structural optimization is the optimization of truss structures [1,2,3,4,5,6,7,8]. The structure layout and topology are fixed, but the cross-sectional areas of various elements are included as design variables in these problems. To locate the global optimal solution that satisfies optimization constraints, efficient optimization algorithms are required. The sequential unconstrained minimization technique [9], the feasible directions method [10,11], the moving asymptotes method [12], and sequential quadratic programming [13] are a few examples of mathematical programming techniques that exhibit fast convergence and high accuracy. However, specific problem-dependent properties like differentiability and convexity are exploited by design. They may not be applicable to truss optimization issues because of these [5].

Utilizing the Block Tridiagonal Matrix Method for the Integration of Compressive Sensing and Clustering in WSN

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Abstract:

Environmental monitoring is the most common use of wireless sensor networks (WSNs), but their operation typically takes a long time. However, the scale of each WSN application is constrained by the inherent restriction of energy. This article demonstrates the framework for integrating compressive sensing and blocks tri-diagonal matrices (BDMs) for clustering in WSNs. These BDMs can be used as matrices of measurement by combining data prediction with retrieval to achieve data processing precision and effectiveness simultaneously in clustered WSNs. Based on the theoretical analysis; this can be designed to be used in a number of algorithms. On the basis of cluster in WSNs for environmental monitoring, the proposed framework provides real-world data demonstrations that can be used to obtain simulation results for a cost-effective solution.

Index Terms:Data prediction, environmental monitoring, compressive sensing, matrix-based compression, and wireless sensor networks (WSNs)

Introduction

Multi-hop routing techniques play a significant role in the implementation of conventional data transmission strategies. On the routing tree, the upstream nodes transmit data hop by hop from each sensor node to the receiver end. During the transmission mode, which necessitates the transmission of information from other distant nodes in addition to the detection data, all sensor nodes remain closer to the receiver, resulting in higher loads for the closer nodes. The examination has been done for some structures for detecting. Structured Random Matrix (SRM) is one of the methods that provides a practical method for sampling between them. Comparing the performance of completely sensing with random sensing matrices, this method has the advantage of increasing sparsity while simultaneously reducing complexity and speeding up computation. Utilizing Kronecker compressed sensing (KCS)[5], the method for exploiting the recently discovered correlation patterns typically entails combining the possibility of distinct bases of sacrifice from each dimension of the signal within the matrix of a single basis.

Optimized and Secure Data Aggregation Protocol for Wireless Sensor Network

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Abstract:

It is a challenge for the community of researchers .Additionally, data transmission security is a significant constraint that makes WSN research increasingly appealing. One method for conserving energy is data aggregation, which reduces computing overhead by eliminating redundant data. However, some security breaches cause the data aggregation readings to be false, rendering the outcomes inaccurate. Additionally, there is a tradeoff between WSN energy consumption and security. Higher levels of security also result in an increase in energy consumption (more encryption and decryption use more energy), and attempting to conserve energy means compromising security in some way. An energy-efficient and secure data aggregation protocol that does not compromise security is proposed in this paper. Encoding the information just at leaf hubs, utilization of protection homomorphism method and cutting the information guarantees secure and exact information collection. Our protocol is more secure and energy efficient than the EESSDA protocol, as demonstrated by our theoretical analysis and simulation.

Keywords:Security, Secure Data Aggregation Protocol, WSN, OSDAP, and EESSDA data aggregation

Introduction

Remote sensor networks are generally made out of hundreds or thousands of modest, low-fueled detecting gadgets with restricted memory, computational, and correspondence assets [1,2]. In both military and civilian applications, battlefield surveillance, target tracking, environmental and health care monitoring, wildfire detection, and traffic regulation are all possible, potentially low-cost solutions offered by these networks.

Forecast of Coronary illness Utilizing Mixture Straight Relapse

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Abstract:

Dynamic Coronary illness (HD) is perhaps of the most well-known infection, and early determination of this sickness is an indispensable movement for some medical services suppliers to stay away from and save lives for their patients. Coronary illness records to be the main source of death across the globe. By using machine learning techniques, hidden information in the health sector can help make early decisions by predicting existing diseases like coronary heart disease. The two-phase implementation of the proposed Hybrid Linear Regression Model (HLRM). The first step is to preprocess the data; KNN and simple mean imputation are used to input missing values, and then Principal Component Analysis is used to find the most important attributes that contribute to the disease's cause. Second, the linear regression technique known as stochastic gradient descent is utilized to record the probability values of the dependent variables in order to ascertain the connection that exists between the independent and dependent variables. The proposed model has been observed to have an overall prediction accuracy of 89.13 percent. The study's findings will serve as a reference for medical professionals and as a platform for academic research.

Keywords:Machine learning; heart disease, association, Linear Regression Model, principal component analysis, Decision tree

Introduction

The leading cause of death worldwide, cardiovascular disease (CVD) claims nearly 18 million lives annually [1]. Atherosclerosis, which causes coronary artery disease (CAD), peripheral arterial disease (PAD), and cerebrovascular disease (CeVD), is the focus of this paper. CAD is the most common of these [2]. Plaque builds up in the heart's vital blood vessels in people who have CAD. Myocardial infarction (MI) and other symptoms are brought on by this decreased blood flow. Within months or years of a patient's diagnosis of cardiovascular disease (CVD), the majority of fatal cardiovascular events, such as heart attack or stroke, occur [3]. In fact, after their initial presentation, many patients experience severe complications or require repeated interventions (recurrent events). The occasions represent an incredible gamble to the patient, and might be a monetary weight to society.

Reconstruction probability-based anomaly detection with variational auto-encoders

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Abstract:

Anomaly detection is the process of classifying events or data points in a dataset that were not expected. In a wide range of fields, it has been demonstrated that variable auto-encoders (VAEs) can deal with challenging issues. Based on the VAE reconstruction probability, we propose a method for finding anomalies. The proposed strategy trains VAEs on three different datasets. Because of the theoretical background and the inclusion of the idea of variability, the reconstruction probability is a much more principled and realistic anomaly score than the reconstruction error utilized by auto-encoders and other data compression techniques. The paper compares and contrasts various anomaly detection techniques with the most recent deep learning models. In an unsupervised setting, variational auto-encoders are trained on three distinct datasets to classify anomalies based on reconstruction probability. In addition, the techniques for anomaly detection are the subject of this paper's in-depth investigation. In order to determine the underlying cause of the anomalies, the data are reconstructed using the generative characteristics of the VAE.

Keywords: Variational auto-encoders (VAEs), anomaly detection (AD), deep learning (DL), KDD99, CIFAR10, and MNIST

Introduction:

An important part of machine learning is anomaly detection, which is a technique for finding anomalies and illogical data mining. Because the speed of manual data processing has been significantly slower than that of computers, especially in the era of big data, faster detection of abnormal data is an important task in today's world [1, 2]. In enterprises, the oddity location of mechanical gadgets is significant. A more immediate and precise method of anomaly detection contributes to accident prevention, enhanced reliability, and increased production efficiency [3, 4]. One-Class Support Vector Machines (OC-SVMs), Principal Component Analysis (PCA), and Local Outlier Factor (LOF) are the primary components of anomaly detection algorithm-based machine learning. In order to train the model for OC-SVM, the normal data are used to create a hyperplane, which is then used to circle the positive data. OC-SVM takes the hyperplane as a standard and considers the examples inside the circle are positive. Since the calculation of portion capability is tedious, OC-SVM isn't broadly utilized under monstrous information [5-7]. Principal components (PCA) is a statistical algorithm for transforming a set of potentially

correlated variables into a set of linearly uncorrelated variables [8]. By comparing the density of the sample to that of its neighbor, LOF determines whether a point is an outlier and measures the sample's density deviation in relation to its neighbors.

A genetic algorithm and dynamic adaptive particle swarm optimization for various constrained engineering design optimization issues

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Abstract:

A powerful versatile molecule swarm streamlining and hereditary calculation is introduced to tackle obliged designing enhancement issues. The fundamental particle swarm optimization algorithm incorporates a dynamic adaptive inertia factor to adaptively adjust searching velocity throughout the search process in order to strike a balance between the global optima search capability and the convergence rate. The particle swarm optimization algorithm incorporates genetic algorithm-related operators like the crossover operator, a selection operator with a time-varying selection probability, and an n-point random mutation operator in order to take full advantage of the optimal solutions it generates. These administrators are utilized to differentiate the multitude and forestall untimely combination. The dynamic adaptive particle swarm optimization and genetic algorithm outperforms several other meta-heuristic algorithms in most cases in terms of solution quality, robustness, and convergence rate in tests on nine constrained mechanical engineering design optimization problems with various objective functions, constraints, and design variables.

Introduction:

Numerous optimization algorithms have been proposed to resolve various nonlinearly constrained engineering design optimization problems. There are basically two types of optimization algorithms: a stochastic calculation and deterministic one. The steepest descend method, the quasi-Newton method, and the interior-reflective Newton method are all examples of conventional deterministic optimization techniques that call for the fulfillment of differentiable objective function conditions. These techniques typically use gradient-based algorithms. Numerous stochastic optimization algorithms, such as the particle swarm optimization (PSO) algorithm,² the genetic algorithm (GA),^{3–5} the firefly algorithm,⁶ ant colony optimization,⁷ artificial bee colony (ABC),⁸ mine blast algorithm (MBA),⁹ simulated annealing (SA) algorithm,¹⁰ biogeography-based optimization (BBO) algorithm¹¹, have been proposed to overcome these shortcomings for complex optimization problems with strong nonlinearity and high dimensions. These methods are Meta-heuristic and influenced by physical

and natural phenomena, these stochastic optimization algorithms are typically meta-heuristic.

A Test Rack for an S-CAM Frontal Car Camera

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Abstract:

An experimental stand for testing the S-CAM front car camera with embedded image recognition systems is presented in this paper. A microprocessor-based system converts the camera's CAN messages into USART messages. The messages are deciphered by MATLAB script based on data set of traffic signs as per Clean Street Code. The testing stand is chiefly held back nothing inspired by the fields of gadgets and innovations connected with auto branch, also. The second objective is to investigate the effectiveness of the traffic sign recognition system, which is one of the S-CAM camera's features. The testing stand's technical specifications, capabilities, and limitations were also discussed. The seat activity was delineated with instances of solid pictures, liveliness and genuine films.

Keywords — auto innovation, safety on the road, ADAS, the front camera, traffic sign recognition

Introduction- Every few years, numerous organizations, such as the WHO, the European Commission, and the Organization for Economic Co-operation and Development (OECD), produce reports that discuss the actual circumstances and shifts in road safety over time. The World Health Organization presents the global situation in the report [1]. Sadly, the number of people killed in traffic accidents continues to rise, reaching a high of 1.35 million in 2016! It is difficult to picture its size and tragically any single case there is extremely sensational circumstances for families. Let's use the WHO Director-General's words: "There is a phone call or a knock on the door that we all dread, in which we are told that a loved one has been killed or severely injured in a road traffic collision." However, there is good news as well. In recent years, there has been a steady decline in the death rate in relation to the number of vehicles on the road in comparison to the global population.

Acquisition of Data Module in Open-Source for Quantum Physics-A Sampler

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Abstract:

The Sinara hardware platform is a modular, open-source measurement and control system designed specifically for hard real-time performance-intensive quantum applications. The open-source software ARTIQ, which offers timing resolution of nanoseconds and latency of sub-microseconds, is in charge of controlling and managing the hardware. With programmable gain and a customizable interface, the Sampler is an all-purpose precision ADC sampling unit. It is utilized in various applications like laser recurrence and power servo. The Sampler module's construction and characteristics as obtained are discussed in this paper.

Keywords—ADC, FPGA, particle trap, quantum instruments, ARTIQ.

Introduction-There are a number of issues with the control electronics used in many trapped-ion and other quantum physics experiments. In most cases, an internally developed solution lacks sufficient consideration for good design, reproducibility, testing, and documentation. It renders those systems unstable, unreliable, and challenging to operate, upkeep, and replicate in other labs. Additionally, it duplicates work done in various laboratories. Additionally, the existing systems' performance and features, such as their capacity for pulse shaping, are becoming insufficient for some experiments. The Sinara and ARTIQ projects [1] provide a crowd-funded, open-source, and commercially available hardware and software environment that addresses the aforementioned issues [2][3]. Over the course of three years, the Sinara project's community developed over forty boards and modules with success. The greater part of them are accessible financially. In addition to Kasli FPGA controller[5], Sampler module is one of the most frequently utilized building blocks of numerous Sinara ecosystem-based control systems.

EFFECTIVE AUTHENTICATION RISK EVALUATION

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ABSTRACT:

Deployed software is currently constantly under attack. Aggressors have been taking advantage of weaknesses for a really long time and appear to be expanding their assaults. Antivirus software, intrusion detection systems, and firewalls can't completely resolve this issue. Attackers can only be stopped and users can feel safe from being exploited if the software development community works together to build safer software. It has been observed that the appropriate security assurance mechanism and countermeasures ought to be included in each phase of the SDLC. Security measures must be incorporated throughout the SDLC phases, starting with requirements and continuing through design, implementation, testing, and deployment. One of the widely accepted measures of protection mechanisms is authentication. Fitting degree of confirmation might be well uphold security highlights and subsequently guarantee security. The risk assessment to incorporate security assurance steps from the beginning of the development lifecycle is followed by the identification of various attributes of the "Authentication" Policy and their weighting. This will make it possible to evaluate the appropriateness of authentication in terms of risk and lead to additional security assurance measures or countermeasures.

KEYWORDS: Software Security, Security Assurance, Authentication Policy, Authentication Attributes, Risk Assessment, Authentication

INTRODUCTION:

Online services still use passwords as their primary form of authentication [23]. Nonetheless, dangers to secret phrase based confirmation are expanding, e.g, by huge scope secret phrase data set holes and accreditation stuffing [26].

As a result, in order to adequately safeguard their users, website owners are required to provide additional or different authentication mechanisms. One such measure is known as two-factor authentication (also known as 2FA), but users have found it to be unpopular [19]. Because it necessitates specialized hardware and user participation, biometric authentication is deemed unsuitable for large-scale online services [9]. Risk-based authentication (RBA) was implemented to safeguard users by a number of large online services for these reasons [27]. RBA is an adaptive authentication method that offers high levels of security while requiring little user interaction. As a result, it has the potential to be more popular with users than 2FA. Additionally, the NIST digital identity guidelines recommend RBA to prevent account takeover [12].

DEVELOPING A FRAME WORK FOR ONLINE PRACTICE EXAMINATION AND AUTOMATED SCORE GENERATION

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Abstract:

The examination procedure is the method by which the ability and quality of the examinees can be measured. It is necessary to guarantee the examinees' quality. The process by which participants can connect to the exam site via the Internet using desktop computers, laptops, or mobile phones, regardless of where they are, is known as the online examination system. The process by which exam answer scripts are automatically evaluated to generate scores is known as automated score generation. Even though there are a lot of online exam systems, their main problem is that they can't accurately calculate an automated score, especially from text-based answers. Additionally, the majority of them speak only one language. Consequently, examinees may take the exam in a particular language. In light of this fact, we present a framework in this paper that can handle written and multiple-choice questions (MCQ) tests in English and Bangla. The questions and answers are stored in a database that we create. In the web page, the questions from the database are displayed, with MCQ answer options and written question text boxes. We analyzed the responses to the written questions in a variety of ways in order to generate the scores for the questions. However, we simply compared the user's responses to those in the database in order to generate the MCQ questions' scores.

Keywords: automated scoring, multiple-choice questions, answer analysis, and experimental analysis. Management.

Introduction:

The examination system helps to distinguish instruction from evaluation. It elevates educators to make the illustration arranging and show in the class cautiously. Additionally, it is an important method for assessing the educational impact. The education system may benefit greatly from the use of online practice examination systems. Presentation of online assessment frameworks can set aside time and cash too as it can legitimize ones capacity. Even though online examinations are not yet very common in our country, it appears to be very helpful for students to prepare for various exams. In light of this, we have developed an online examination system that enables students to take a variety of MCQ and written exams and generate automatic scores upon completion. One can take the exam in real time and instantly receive the results if they have access to an Internet-connected computer. He or she can even use a laptop or smart phone to

attend the exam while moving around.

Coupling coefficient observer for dynamic wireless charging devices based on the Kalman filter

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Abstract:

When the load impedance is identical to the optimal impedance value in the dynamic wireless charging system for electric vehicles, the transfer efficiency achieves its maximum value. However, the coupling coefficient, which varies with the location of the electric car, determines the ideal impedance value. Therefore, knowledge of the coupling coefficient is required to both monitor the ideal impedance and to increase transfer efficiency. A coupling coefficient observer method based on the Kalman filter is suggested in this article. The active rectifier is then improved in effectiveness on the secondary side by an optimal impedance controller. The outcomes demonstrate the high accuracy of the estimation technique. Both when effect measurement noise and changing system parameters, the estimated mutual inductance error is less than 5%. Compared to the traditional estimation technique, system efficiency increased by 3.2%.

Keywords: Active rectifier, Dynamic wireless charging, Electric vehicle, Improve efficiency, Kalman filter

Introduction

Because it streamlines the power supply process and reduces some of the risks associated with electrical leakage for users, wireless power transfer (WPT) technology is becoming more and more popular for industrial uses as well as electric vehicles (EVs) [1][3]. Because WPT can decrease battery capacity and increase journey distance, research is being done on using it to charge EVs while they are in motion [4] through [7]. The only factor affecting transfer effectiveness after the coil, compensation circuit, and working frequency have been developed is the load impedance. Only at a load impedance does the transfer efficiency reach its maximum, and this number is referred to as the optimal load impedance [1]. At different load impedances, efficiency rapidly decreases [10]. Additionally, the load resistance varies based on the battery's level of charge [11] through [13]. Impedance matching management is therefore required to increase effectiveness.

A reliable fuzzy logic PI controller for charging the batteries in photovoltaic systems

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Abstract:

This article describes a photovoltaic (PV) system design that enables battery charging in a variety of climatic conditions. Two DC-DC converters a boost converter and a Buck converter—make up the device under investigation. The first one uses a novel variable step size P&O-based MPPT with high tracking precision in comparison to traditional methods like PO and INC to extract the most power possible from the PV array. In contrast to traditional PI and PID controllers, the second converters seek to regulate the output voltage and current that feeds the battery using a robust optimal PI (O-PI). O-PI has a faster time response and higher accuracy. The MATLAB/Simulink environment is used to evaluate and validate the overall system as well as the control strategies. The simulations results show the effectiveness and the robustness of the system.

Keywords: Battery, Optimal PI, Photovoltaic system, PID controller, Variable step size P&O

INTRODUCTION

Global demand for electricity has skyrocketed, particularly in isolated rural regions and mountains. For the generation of energy and heat, fossil fuels such as coal, oil, and gas are still required. They are the primary sources of CO₂ emissions, but unlike renewable sources, their stocks are limited. Due to their low cost, photovoltaic (PV) systems have captured the attention of many people. The generated energy will be kept in batteries if it is not immediately used. These panels do, however, have a poor efficiency range [1] and current and voltage that are affected by various environmental factors like temperature and solar radiation levels [2]. There is only one point on the curve where the PV cell produces the most electrical power because of the nonlinear nature of the PV with regard to the generation of electrical energy. To maintain maximum power point tracking, a unique control algorithm is required, and this is where maximum power point tracking conflicts with optimizing the performance of solar generators

Analysis of the performances of internal permanent magnet motors with various rotor iron pole shapes

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Abstract:

Since the development of permanent magnet material with high energy products, i.e., rare earth permanent magnet material, interior permanent magnet motors (IPMMs) have become more and more common. The performance of IPMMs with various rotor iron pole shapes, such as eccentric, sinusoidal, and sinusoidal with 3rd order harmonic injected rotor pole arc shapes, is examined in this article. Comparisons have been made between the cogging torque, static torque, torque ripple, torque-speed, and power-speed graphs of the aforementioned motors. To emphasize the impact of the rotor pole arc shape on the performance of the aforementioned motors, it should be observed that the motors mentioned have been designed with the same stator, PM shape, and dimensions. The aforementioned devices have been designed and examined using two-dimensional (2D) finite element analysis (FEA). It has been discovered that the IPM's rotor iron pole structure has a significant impact on the machine's operation, specifically on the output electromagnetic torque and its ripple.

Keywords: Cogging torque, Electromagnetic torque, Interior permanent magnet machine, Torque-speed curve

Introduction

Due to their obvious advantages, interior permanent magnet motors (IPMMs) have been regarded as potential candidates for a variety of applications [1]–[6]. Increasing the mechanical strength and demagnetization withdraw capacity will improve the machines' reliability because IPMMs manufacture with buried PM in the rotor iron. Additionally, due to the presence of the reluctance torque [7]-[13], such a structure produces a greater electromagnetic torque in comparison to other PM machine configurations. Increasing the IPMMs' average torque capacity has been discussed in a lot of writing. Some studies concentrate on the location and configuration of the magnet because these factors are crucial to the effectiveness of IPMMs [14]. I-type, spoke-type, V-type, and U-type are the four different PM configurations that have been launched with IPMMs. Each arrangement has benefits and drawbacks relative to the others, according to the literature [15], [16]. The primary issue with such a structure is rotor iron saturation, even though

the V-type machine had the greatest torque capacity.

Applications of DTC with fuzzy logic in multi-machine systems for propulsion

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Abstract:

In this study, an electric vehicle application of the direct torque control (DTC) technique for multi-machine systems (EVs). The variable master-slave control (VMSC) initially ensures magnetic quantity management while the DTC control technique associated with the model reference adaptive system (MRAS) is used for speed control. A DTC technique and a fuzzy logic approach have been joined to improve the studied system's technical performance. These two control techniques are used to emphasize the traction chain's speed, accuracy, stability, and durability during specific stress tests placed on the wheel motor. The findings from the MATLAB/Simulink software enabled a technical performance comparison of the two suggested methods. It should be noted that the direct fuzzy logic torque control (DFTC) has better performance than the DTC associated with the MRAS system as a rise time reduction of 1.4 percent, an oscillation of torque, and flux amplitude of less than 9 percent, static steady-state error near zero. The DFTC control method responds favorably to electric vehicle traction chain systems by the nature of the comfort and safety provided.

Keywords: Asynchronous motor, Direct torque control, Electric vehicle, Fuzzy logic, Variable master slave control

Introduction

The new generation of electric cars has proven to be valuable assets in light of the rapidly rising energy demand and the global objective to protect the environment by lowering greenhouse gas emissions [1]–[3]. As a result, new innovations, particularly in the area of electric drive, are made possible by the advancement of electric mobility [4], [5]. The traction system mechanism of the electric car is controlled by electric actuators. Due to their dependability, affordability, and outstanding robustness, induction devices are frequently employed for this purpose [6]–[9]. Only when an appropriate control system, such as direct torque control (DTC), is used to move the electric actuator that makes up the vehicle can it operate at its best [10]. It is true that this control system guarantees a quick dynamic response of the torque and stator flux, but it also has some disadvantages that affect the wear of the engine's acceleration and increase noise levels in the passenger area. This control system has undergone numerous changes and improvements since it was created by Takahashi and Noguchi [10] including direct torque control linked to vector modulation (SVM-DTC), direct torque control based on artificial intelligence like fuzzy logic (DFTC), neural networks (DTNC), and genetic algorithms [2].

Design and Analysis of Boost Converter for Maximum Power Point Tracking in Solar PV systems

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Abstract:

Alternative energy sources, like renewable energy, should help us move away from energy sources that depend on petroleum. Solar energy is the most palatable option among all renewable energy sources because it is widely accessible and cost-free. A solar array plus a DC-DC converter make up a typical solar power system. In order to transfer the most power possible from the solar PV module to the load, a DC-DC converter serves as an interface between the load and the PV module. Analyzing the converter is essential in order to create a photovoltaic (PV) power generation system with an appropriate converter topology. In this study, a DC-DC boost converter model and physical design for a solar PV system (the TET-1210 manufactured by Thrive Energy Technologies Pvt. Ltd.) are described and evaluated using MATLAB's SIMSCAPE library. The outcome demonstrates that any maximum power point tracking technique may be used to implement the planned converter, which provides the highest power at 70.06% of duty cycle. This work also provides the tiny signal analysis of the boost converter, which is highly beneficial for the stability analysis.

Keywords: DC-DC converter; boost converter; maximum power point tracking; converter design.

Introduction

The continued use of fossil fuels has lowered the amount of fossil fuel reserves, negatively impacted the ecosystem by depleting the biosphere, and contributed cumulatively to global warming. Solar energy offers a possible substitute for the non-renewable resources, which are becoming more and scarcer. The climate in India, where there are roughly 300 days of clear, sunny skies, offers a lot of potential for using solar power. Solar energy has the ability to provide 20 MW of power per square kilometer and can be developed for long-term use. A solar panel is a grouping of connected photovoltaic (sometimes referred to as solar) cells. The solar panel can be utilised in a wide range of business and residential applications, including as part of a larger photovoltaic system to produce and supply electricity. One solar panel has a finite amount of power it can produce. The photovoltaic effect allows solar panels to generate electricity using the sun's light energy. Using solar photovoltaic (PV) technology, solar energy is transformed into electrical energy. Solar PV, Power electronics converters [2–3], and a control device to manage the electricity collected from solar PV make up the entire solar energy conversion system.

Design and performance analysis of three photovoltaic systems to improve solar power management

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Abstract:

The design, implementation, and characterization of a low-cost, small-scale solar tracking system are discussed in this paper. A dual-axis, sensor less (open loop), solar tracker was designed. The system was made to be sturdy and transportable. Two motors, a 10-watt solar panel, an Adriano microprocessor, a Ni-Cd battery, and several sensors for measuring temperature, humidity, position, and light intensity made up the solar tracker's hardware. The sensors' data were gathered using a micro-SD card reader. With a $\pm 1^\circ$ accuracy, the device could follow the sun's position. Three photovoltaic (PV) systems were compared in order to characterize the performance of the tracker. The solar tracker was the third PV system, with the other two fixed (at 0 and 45 degrees). The solar tracker generated 98.1mW on average, the 45-degree angle PV system produced 96.9mW on average, and the 0-degree angle PV system produced 95mW on average. The power produced by the solar tracker system increased when compared to the baseline data. Notwithstanding the fact that the increase in electricity generation in this study was not large, the project's primary goal was accomplished.

Keywords: dual-axis solar tracker, automated position, photovoltaic cells, sensor less solar tracker.

INTRODUCTION

A small-scale solar tracker system was designed, built, and characterized as part of the research project. One of society's most pressing challenges in the twenty-first century is finding energy sources to meet the planet's rising demand [1]. Electricity costs can be significantly decreased by using photovoltaic (PV) solar cells to convert sunlight to electricity. Sun trackers are crucial tools for increasing productivity in this context [2]. A solar tracker can be used to watch the sun's position and make sure that the sun's rays are constantly perpendicular to the surface of the solar panel, allowing for the extraction of the maximum output power from a PV module [3, 4]. Studies have shown that solar trackers can catch 20% or more of the sun's energy [5, 6]. Sun trackers can be created as single-axis systems with one degree of freedom or dual-axis systems with two degrees of freedom [7]. It was demonstrated in [8] that a solar tracker with one degree of freedom can gather up to 20% more energy than a fixed PV module. According to [9]'s authors, a dual-axis solar tracker can provide up to 33% more energy than a fixed PV module.

Study of PV Inverters for On-Grid and Off-Grid Micro Resource

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Abstract:

This paper reviews the status in industry and academia regarding configurations, topologies, controls, and grid connections in grid-tied and micro-grid PV inverter applications. The paper will discuss the major technical needs to address problems in bringing cost down, increasing efficiency and improving reliability/availability. The paper foresees that new grid interconnection features will have to be integrated more into the inverters, along with the wide spreading use of distributed generations.

Keywords: grid-tie PV inverter, modular inverter, Inverter efficiency, micro-grid

Introduction

The tremendous growth in the PV market in the recent years all over the world has been stimulating wide interests from industry researches and universities participating in the technology development. Significant efforts on new materials, device concepts and processes, and manufacturing technologies are being made in order to bring down the costs of PV cells. Inverter which usually represents 20% of the system cost and the major reliability bottleneck in a PV system should receive due attention. Typical guarantee for PV inverter is 5 years, except for a few manufacturers who are jumping to 10 years, in comparison to 20 years for PV panels. The key technical aspects that will drive improvements in cost, reliability and efficiency of PV inverters, which are key to success, will be addressed in this paper. Inverter configuration and topology represents the way that how DC power from PV array, small or large scale, will be extracted, and how this extracted power will be converted to AC connected to grid or fed to island load. Inverters designed with modularity and scalability will drive the cost down in large volume production due to simplification in designing, manufacturing, operation, and maintenance processes. PV inverter system with multiple inverter modules operating in parallel are also expected to improve system availability and efficiency.

A Technique for Determining the Fewest Items in Fuzzy Clusters

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Abstract:

The difficulty of estimating the value of the least number of objects in fuzzy clusters is discussed in the theoretical note. This problem is followed by the detection of the best number of items in fuzzy clusters using heuristic probabilistic clustering. A method for determining the initial minimum value of the number of objects in fuzzy clusters is suggested, and a strategy for determining the optimal maximal number of elements in a priori unknown number of fuzzy clusters of the sought clustering structure is provided. Conclusions are drawn after considering numerical instances.

Keywords: CFS clustering, incremental clustering, the Industrial Internet of Things, and K-medoids

Introduction:

Using a dynamic global information network, smart electronics are integrated into production systems to create industrial IoT. It is making modern industrial production and applications more effective and efficient. For instance, real-time condition monitoring, structural health monitoring, remote diagnosis and remote control of production systems are all made possible by industrial IoT. Furthermore, smart factories can dynamically organize with enhance production due to industrial IoT. In the meantime, industrial IoT presents numerous new difficulties for large data management and smart control. Uncommonly, a ton of sensors conveyed in modern IoT frameworks are gathering a critical volume of information stream or dynamic information. However, it is difficult to analyze a large data stream because the underlying pattern they reveal may change over time and the large numbers of samples that enter the stream are typically time-dependent.

Analyzing the detection of automobiles using remotely sensed data and high-resolution satellite images

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Abstract:

Due to the numerous drawbacks of conventional techniques for gathering traffic data, the intelligent traffic system has turned its attention to the collection of road traffic data from high-resolution satellite photos. In this study, the high-resolution satellite image processing and vehicle recognition system are established using the object-oriented classification method. Prior to improving vehicle information in remote sensing photos, the high-resolution satellite image was processed by median filtering and go through demising. This was accomplished utilizing the stretch of the grey histogram. Second, the image was segmented at the best scale possible using a method that took the vehicle's maximum average area into account. Then, a unique set of classification rules has been created for automobiles with dark colors based on their various color features. Then according to different color characteristics of vehicles with dark establish a separate classification rule set, based on the object-oriented classification of vehicle classification. By extracting feature threshold classification of more bright color vehicles and using a relationship between classes of vehicles with the fuzzy classification method the dark color vehicles has been extracted. Finally formed a high-resolution satellite remote sensing overall framework of vehicle detection has been performed.

Keywords: Agricultural planning, Image processing, Object-based classification, unmanned aerial vehicle

Introduction:

As remote sensing technology advances, the method of traffic parameter extraction using photos from remote sensing is quickly becoming known to people. It is crucial to utilize the sensor to gather remote detecting information that reflects ground transportation. One can eventually finish target detection, recognition, and vehicle traffic information extraction by utilizing methods like human-computer interaction and visual interpretation of remote sensing image. Many related advances have emerged throughout the course of recent many years and numerous related technologies have emerged in recent decades. The ability to provide multiple surface feature information at various spatial and temporal scales is a benefit of remote sensing. Traffic processors that estimate vehicles' speeds on the road network which is a radical departure from the conventional approach.