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18th-19th March 2018

NATIONAL CONFERENCE

ON

COMPUTING AND COMMUNICATION TECHNOLOGY- 2018

Organized by

Department of Computer Science & Engineering

Raajdhani Engineering College,Bhubaneswar

MESSAGE BOARD

MESSAGE

SRI CA. B. RAMPRASAD RAO

Chairman

Raajdhani Engineering College, Bhubaneswar

I am delighted to know that Raajdhani Engineering College Bhubaneswar is organizing National Conference on 18th-19th March 2018 and publish a proceedings on "National Conference On Computing and Communication Technology".

Participation of different personalities from the field of engineering, science and industries will definitely bring awareness among the participants and promote this to help the development of society and nation ultimately.

I hope the outcome from such type of seminar will benefit every stake holders and give our institution a new dimension.

I wish the program all success.

SRI CA. B. RAMPRASAD RAO

Chairman

MESSAGE

DR. MANOJ KUMAR PALO

Vice-Chairman

Raajdhani Engineering College, Bhubaneswar

It gives me immense pleasure to know that Raajdhani Engineering College Bhubaneswar is organizing National Conference on 18th-19th March 2018 and publish a proceedings on "National Conference On Computing and Communication Technology".

Dignitaries present in the forum will focus on role and responsibility of

Professional Student in a wider way and inspire the participants to work for the society and nation. I hope this national seminar will disseminate and share elaborate knowledge and experiences in creating the awareness among the professionals for development of the nation.

I wish the national seminar all success.

DR. MANOJ KUMAR PALO

Vice Chairman

MESSAGE

PROF. (DR.) BIMAL SARANGI

Principal

Raajdhani Engineering College, Bhubaneswar

I am glad to know that Raajdhani Engineering College Bhubaneswar is organizing National Conference on 18th-19th March 2018 and publish a proceedings on "National Conference On Computing and Communication Technology".

This forum will discuss extensively about the role and responsibility of the professionals through sharing the knowledge and experiences from the experts. I hope this seminar will bring a positive impact on participants to understand their responsibility and participation as individual for the development of the nation.

I thank the organizers and wish the program a grand success.

PROF. (DR.) BIMAL SARANGI

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Maximum power point tracker using a intelligent sliding mode controller for a solar system

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Abstract:

A PV module or array's operating efficiency is highly dependent on the climate (temperature/irradiation) and non-linear. Therefore, maximum power point tracking (MPPT) methods are necessary to guarantee that the PV array generates the maximum amount of power possible at any moment and regardless of the external conditions. The incremental conductance (INC) controller, which aims to provide a reference proportional to the PV array's optimal power PMPP, and the sliding mode control (SMC), which is in charge of controlling the GPV voltage, are two cascaded controllers that are taken into consideration as part of the solution proposed in this paper. Designing a sliding surface that identifies the operating spot is the SMC's plan of attack. Utilizing cascade control, the SMC and INC together seek to accomplish quick MPPT action on PV systems. The suggested controller can withstand shifting weather patterns.. The PSIM software presents the findings, which show how well the SMC controller performs while attesting to the fact that the new strategy has increased output and energy efficiency.

Keywords: Boost converter, Incremental of conductance, MPPT, PV systems, Sliding mode control

Introduction:

Solar photovoltaic energy is a significant resource that is being used more and more in a variety of uses because it is clean, renewable, and un renewable. All photovoltaic modules will be linked to a mechanism that allows the search and tracking of the maximum power point for optimal module utilization. (MPPT). Since it is challenging to obtain the MPP with the lowest fluctuation close to the operational point, much effort has been put into enhancing the system's performance. We highlight perturbation and observation (P&O), incremental conductance (INC), and fuzzy logic (FL) [3]. Fractional short circuit current (FSCC) [5] and fractional open circuit voltage (FOCV) [4] are two examples. The degree to which the tracking reaction depends on the size of the disturbance is the main issue with all of these MPPTs. The tracking signal oscillates roughly around its reference point even in stable circumstances [6]. A second loop, usually a PI controller, must be used to maintain accurate MPP monitoring [7]. These control laws might not be adequate or reliable, particularly when the requirements for dynamic features and precision are very stringent.

A new algorithm to enhance security against cyber threats for internet of things application

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Abstract

One major problem is detecting the unsuitability of traffic caused by a distributed denial of services (DDoS) attack produced by third party nodes, such as smart phones and other handheld Wi-Fi devices. During the transmission between the devices, there are rising in the number of cyber attacks on systems by using negligible packets, which lead to suspension of the services between source and destination, and can find the vulnerabilities on the network. These vulnerable issues have led to a reduction in the reliability of networks and a reduction in consumer confidence. In this paper, we will introduce a new algorithm called rout attack with detection algorithm (RAWD) to reduce the affect of any attack by checking the packet injection, and to avoid number of cyber attacks being received by the destination and transferred through a determined path or alternative path based on the problem. The proposed algorithm will forward the real time traffic to the required destination from a new alternative backup path which is computed by it before the attacked occurred. The results have showed an improvement when the attack occurred and the alternative path has used to make sure the continuity of receiving the data to the main destination without any affection.

Keywords

Buffer optimization; internet of things; quality of service; rout attack with detection algorithm; user data protocol;

Introduction

There are many reasons why IoT devices are difficult to secure. Security is frequently prioritized less than time-to-market metrics because manufacturers and innovators are under pressure to release new products. Numerous organizations are additionally uninformed about the weaknesses that IoT presents and are regularly more worried about the expense investment funds and accommodation that IoT gives.

Server virtualization in higher educational institutions: a case study

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Abstract

Virtualization is a concept in which multiple guest operating systems share a single piece of hardware. Server virtualization is the widely used type of virtualization in which each operating system believes that it has sole control of the underlying hardware. Server virtualization has already got its place in companies. Higher education institutes have also started to migrate to virtualized servers. The motivation for higher education institutes to adopt server virtualization is to reduce the maintenance of the complex information technology (IT) infrastructure. Data security is also one of the parameters considered by higher education institutes to move to virtualization. Virtualization enables organizations to reduce expenditure by avoiding building out more data center space. Server consolidation benefits the educational institutes by reducing energy costs, easing maintenance, optimizing the use of hardware, provisioning the resources for research. As the hybrid mode of learning is gaining momentum, the online mode of teaching and working from home options can be enabled with a strengthened infrastructure. The paper presents activities conducted during server virtualization implementation at RV College of Engineering, Bengaluru, one of the reputed engineering institutes in India. The activities carried out include study of the current scenario, evaluation of new proposals and post-implementation review.

Keywords

cloud; data center; optimization; server; virtualization;

Introduction

Virtualization is the idea that resources like servers, operating systems, desktops, networks, storage, and files can be created virtually. Increased scalability can be achieved through virtualization. Additionally, it fundamentally alters conventional computing. Virtualization can be used at a variety of layers, including the network, operating system, and hardware [1]. Virtualization has grown in popularity among Fortune 500 companies and universities as a way to use information technology more effectively and efficiently. In order to meet the demands of stakeholders, higher education institutions now require extensive computing infrastructure. Server virtualization is one of the approaches being taken to cut costs.

The role of neural network for estimating real estate prices value in post COVID-19: a case of the middle east market

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Abstract

The main goal of this paper was to explore the use of an artificial neural network (ANN) model in predicting real estate prices in the Middle East market. Although conventional modeling approaches such as regression can be used in prediction, they have a weakness of a predetermined relationship between input and output. In this regard, using the ANN model was expected to reduce the bias and ensure non-linear relationships are also covered in the prediction process for more accurate results. The ANN model was created using Python v.3.10 program. The model exhibited a high correlation between predicted and actual house price data (R=0.658). In this respect, it was realized that the model could be effectively used in appraising real estate by investors. However, a major limitation of the model was realized to be a limited dataset for large and luxurious houses, which were not accurately predicted as data distribution between actual and predicted values became sparse for high house prices. A key recommendation made is that future research should include more variables related to luxurious houses and macroeconomic factors to increase the ANN model accuracy.

Keywords: artificial neural networks; COVID-19; digital economy; python; real estate prices; Saudi Arabia; technology;

Introduction:

Traditionally, human behavior interpretation has been a major component of the appraisal process for residential real estate. This entails anticipating human decision-making based on a few subjective and objective factors [22, p. 4]. The final value of the property is influenced by the complex combination of these factors. A recent report by Abidoye also, Chan [1] found that, most generally, the traits that decideproperty estimation are ordered into three gatherings. The gatherings or classescontain factors that relate to the underlying, locational, and neighborhood credits. The factors that are connected to the housing itself are referred to as the structural attributes. These can be things like the size of the floor or the number of bedrooms and bathrooms, but they can also be things like the age and condition of the house.

4

Detection of chest pathologies using autocorrelation functions

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Abstract

An important feature of image analysis is texture, seen in all images, from aerial and satellite images to microscopic images in biomedical research. A chest X-ray is the most common and effective method for diagnosing severe lung diseases such as cancer, pneumonia, and tuberculosis. The lungs are the largest X-ray object. The correct separation of the shapes and sizes of the contours of the lungs is an important reason for diagnosis, because of which an intelligent information environment can be created. Despite the use of X-rays, to identify the diagnosis, there is a chance that the disease will not be detected. In this sense, there is a risk of development, which may be fatal. The article deals with the problems of pneumonia clustering using the autocorrelation function to obtain the most accurate result. This provides a reliable tool for diagnosing lung radiographs. Image pre-processing and data shaping play an important role in revealing a well-functioning basis of the nervous system. Therefore, images from two classes were selected for the task: healthy and with pneumonia. This paper demonstrates the applicability of the autocorrelation function for highlighting interest in lung radiographs based on the fineness of textural features and k-means extraction.

Keywords: chest radiograph; clustering; medical imaging; pathology; texture;

Introduction

Disorders of the lungs and chest are among the most common causes of morbidity and mortality worldwide [1]. For evaluating the lungs, airways, pulmonary vessels, chest wall, heart, pleura, and mediastinum, chest radiography is a common and inexpensive diagnostic tool [2]. Chest radiography is widely used to identify and diagnose a variety of chest abnormalities, including consolidations, opacities, cavitations, blunted costophrenic angles, infiltrates, cardiomegaly, nodules, and others. Modern digital radiography (DR) machines are quite affordable. 3]. There is a significant amount of anatomical and pathological information packed into each chest X-ray (CXR) image, making disease detection and interpretation potentially challenging [4]. For medical professionals, correctly interpreting information is always a significant challenge. Pathologies, for example, lung knobs or solidification might be darkened by superimposed thick designs (for instance, bones) or by unfortunate tissue contrast between adjoining physical designs [4].

Genetic algorithm to optimization mobility-based dengue mathematical model

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Abstract

Implementation of vaccines, mosquito repellents and several Wolbachia schemes have been proposed recently as strategies against dengue. Research showed that the use of vaccine and repellent is highly effective when implemented to individuals who are in area with high transmission rates, while the use of Wolbachia bacteria is strongly effective when implemented in area with low transmission rates. This research is to show a three-strategy combination to cope with the dengue using mathematical model. In dengue mathematical model construction, several parameters are not yet known, therefore a genetic algorithm method was used to estimate dengue model parameters. Numerical simulation results showed that the combination of three strategies were able to reduce the number of infected humans. The dynamic of the human population with the combination of three strategies on average was able to reduce the infected human population by 45.2% in immobility aspect. Furthermore, the mobility aspect in dengue model was presented by reviewing two areas; Yogyakarta and Semarang in Indonesia. The numerical solutions showed that the trend graph was almost similar between the two areas. With the maximum effort given, the combination control values decreased slowly until the 100th day.

Keywords: Genetic algorithm; mobility-based dengue; numerical analysis; optimal control; parameter estimation;

Introduction

Dengue is an infectious disease caused by a virus spread by female Aedesaegypti and Aedesalbopictus mosquitoes. There are four distinct serotypes of the dengue virus (DENV), and both infants and adults are susceptible. The typical incubation period is four to ten days, while the infection period is two to seven days [1]. The Neglected Tropical Diseases (NTD) roadmap lists 17 neglected tropical diseases, including dengue [2]. In late many years, the rate of dengue has increased emphatically. Nearly half of the world's population is at risk of contracting the infection, according to estimates provided by the World Health Organization (WHO). Additionally, given that the majority of dengue cases are asymptomatic infections (recessive infections), the actual number may be higher than what has been reported. Bhatt et al. state that [4], 390 (95 percent CI: 284, 528) million dengue contaminations happen every year, of which something like 96 (95% CI: 67,136 million individuals exhibit clinical symptoms. Dengue has caused a colossal weight of sickness universally. The year 2019 saw the largest number of dengue cases detailed around the world in late memory.

Improved cipher text-policy time using short elliptic curve Diffie Hellman

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Abstract

Ciphertext-policy attribute-based encryption (CP-ABE) is a suitable solution for the protection of data privacy and security in cloud storage services. In a CP-ABE scheme which provides an access structure with a set of attributes, users can decrypt messages only if they receive a key with the desired attributes. As the number of attributes increases, the security measures are strengthened proportionately, and they can be applied to longer messages as well. The decryption of these ciphertexts also requires a large decryption key which may increase the decryption time. In this paper, we proposed a new method for improving the access time to the CP using a new elliptic curve that enables a short key size to be distributed to the users that allows them to use the defined attributes for encryption and decryption. Each user has a specially created key which uses the defined attributes for encryption and decryption based on the Diffie-Hellman method. After the implement, the results show that this system saves nearly half of the execution time for encryption and decryption compared to previous methods. This proposed system provides guaranteed security by means of the elliptic curve discrete logarithmic problem.

Keywords: attribute-based encryption; ciphertext policy time short elliptic curve Diffie–Hellman CPT-SECDH; ciphertext-policy time; Diffie–Hellman; elliptic curve;

Introduction

The physical security measures of locks, document seals, and so on are no longer necessary as the use of computers to exchange information electronically grows rapidly. However, electronic documents still fulfill the essential requirement of securely exchanging information; typically through digital signatures and encryption. Cryptography is the science of keeping messages safe. Messages are encrypted and decrypted in cryptography. An algorithm is used in encryption to turn plaintext into ciphertext, and decryption is the process of retrieving the encrypted message (Fig. 1). A cryptographic calculation is the numerical capability utilized for encryption and decoding. Cryptography is frequently required to provide authenticity, integrity, and non-repudiation in addition to confidentiality.

Application of informative textural Law's masks methods for processing space images

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Abstract

Image processing systems are currently used to solve many applied problems. The article is devoted to the identification of negative factors affecting the growth of grain in different periods of harvesting, using a program implemented in the MATLAB software environment, based on aerial photographs. The program is based on the Law's textural mask method and successive clustering. This paper presents the algorithm of the program and shows the results of image processing by highlighting the uniformity of the image. To solve the problem, the spectral luminance coefficient (SBC), normalized difference vegetation index (NDVI), Law's textural mask method, and clustering are used. This approach is general and has great potential for identifying objects and territories with different boundary properties on controlled aerial photographs using groups of images of the same surface taken at different vegetation periods. That is, the applicability of sets of Laws texture masks with original image enhancement for the analysis of experimental data on the identification of pest outbreaks is being investigated.

Keywords: Clustering; image processing; law's textural masks; normalized difference vegetation index; orthogonal transformation; satellite images;

Introduction

Emotional information derived from speech, facial expressions, gestures, and so on can be facilitated by human emotion recognition. Emotion recognition techniques have recently combined speech and visual data to identify human emotions. When comparing the results to speech emotion sensing, it is desirable to improve audiovisual-based methods' recognition accuracy. Several methods for extracting features have been described in [1–3] in order to improve facial expression recognition accuracy. However, when it comes to distinguishing human emotional states from audiovisual signals, there is a tradeoff between accuracy and computing power. Truth be told, discourse can give a most regular and principal interface for human-PC cooperation (HCI). Emotion sensing in speech (ESS) systems play a significant role in HCI due to the rapid expansion of computer power and advancements in speech technologies. ESS has a few expected applications, for example, the connection points with robots [4-6], call focus conditions [7], and improvement of discourse and speaker acknowledgment execution [8].

Implementation of recurrent neural network for the forecasting of USD buy rate against IDR

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Abstract

This study implements a recurrent neural network (RNN) by comparing two RNN network structures, namely Elman and Jordan using the backpropagation through time (BPTT) programming algorithm in the training and forecasting process in foreign exchange forecasting cases. The activation functions used are the linear transfer function, the tan-sigmoid transfer function (Tansig), and the log-sigmoid transfer function (Logsig), which are applied to the hidden and output layers. The application of the activation function results in the log-sigmoid transfer function being the most appropriate activation function for the hidden layer, while the linear transfer function is the most appropriate activation function for the output layer. Based on the results of training and forecasting the USD against IDR currency, the Elman BPTT method is better than the Jordan BPTT method, with the best iteration being the 4000th iteration for both. The lowest root mean square error (RMSE) values for training and forecasting produced by Elman BPTT were 0.073477 and 122.15 the following day, while the Jordan backpropagation RNN method yielded 0.130317 and 222.96 also the following day.

Keywords: Back propagation through time; forecasting; foreign exchange; recurrent neural network;

Introduction

Profound learning has revived investigation into artifcial brain organizations. Deep neural networks (DNNs) have achieved breakthrough performance in computer vision, natural language processing, and other domains due to significant methodological advancements associated with the optimization and regularization of large neural networks, the availability of large data sets together with the computational power to train large networks, and the development of powerful, user-friendly software libraries (LeCun et al. 2015). An element that separates profound gaining from traditional AI is the capacity consequently remove discriminative highlights from crude information (Nielsen 2015). This capability reduces the need for manual feature engineering, simplifies model maintenance tasks, and, more generally, expands the scope of deep learning applications. It also lowers the costs of implementing a learning algorithm in industry.

A review on detecting brain tumors using deep learning and magnetic resonance images

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Abstract

Early detection and treatment in the medical field offer a critical opportunity to survive people. However, the brain has a significant role in human life as it handles most human body activities. Accurate diagnosis of brain tumors dramatically helps speed up the patient's recovery and the cost of treatment. Magnetic resonance imaging (MRI) is a commonly used technique due to the massive progress of artificial intelligence in medicine, machine learning, and recently, deep learning has shown significant results in detecting brain tumors. This review paper is a comprehensive article suitable as a starting point for researchers to demonstrate essential aspects of using deep learning in diagnosing brain tumors. More specifically, it has been restricted to only detecting brain tumors (binary classification as normal or tumor) using MRI datasets in 2020 and 2021. In addition, the paper presents the frequently used datasets, convolutional neural network architectures (standard and designed), and transfer learning techniques. The crucial limitations of applying the deep learning approach, including a lack of datasets, overfitting, and vanishing gradient problems, are also discussed. Finally, alternative solutions for these limitations are obtained.

Keywords: brain tumor datasets; convolution neural network models; deep learning; detecting brain tumors; transfer learning;

Introduction

Cancer is a sickness happening in various locales, and the intracranial growth is a typical illness in the sensory system, which is exceptionally hurtful to the human sensory system [1]. There are typically two types of intracranial tumors: essential and auxiliary intracranial cancer. The most prevalent brain tumor is called brain glioma (BG), and it is caused by glial cells. Infiltrating growth, particularly high-grade BG [2], is what makes it unique. Because of this, it is hard to tell it apart from normal brain tissue, increasing the likelihood that it will need to be removed surgically. Thus, the right finding and reviewing of BG before medical procedure are of extraordinary importance for forming the clinical therapy plan [3, 4]. The degree of cancer is

Overview of convolution neural networks architectures for brain tumor segmentation

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Abstract

Due to the paramount importance of the medical field in the lives of people, researchers and experts exploited advancements in computer techniques to solve many diagnostic and analytical medical problems. Brain tumor diagnosis is one of the most important computational problems that has been studied and focused on. The brain tumor is determined by segmentation of brain images using many techniques based on magnetic resonance imaging (MRI). Brain tumor segmentation methods have been developed since a long time and are still evolving, but the current trend is to use deep convolutional neural networks (CNNs) due to its many breakthroughs and unprecedented results that have been achieved in various applications and their capacity to learn a hierarchy of progressively complicated characteristics from input without requiring manual feature extraction. Considering these unprecedented results, we present this paper as a brief review for main CNNs architecture types used in brain tumor segmentation. Specifically, we focus on researcher works that used the well-known brain tumor segmentation (BraTS) dataset.

Keywords

artificial neural networks; brain tumor segmentation; convolutional neural networks; deep learning; magnetic resonance imaging;

Introduction

Brain tumor patients are particularly vulnerable to the disease's debilitating and potentially fatal effects [1]. Tumors of the brain come in two varieties: secondary tumors that begin in other parts of the body and spread to the brain as a result of the spread of malignant cells are both primary tumors. Tumors that start in the brain and spread to other parts of the body are called primary tumors. One of the most common types of tumors are primary tumors like gliomas [2–4]. However, the brain's glial cells are not the only ones affected; the illness has likewise stretched out to the tissue around them. Astrocytoma, on the other hand, is a low-grade glioma (LGG) with a slower growth rate and a longer overall survival time.

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Efficient machine learning classifier to detect and monitor corona virus disease cases based on internet of things framework

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Abstract

In this research work, corona virus disease (COVID-19) has been considered to help mankind survive the present-day pandemic. This research is helpful to monitor the patients newly infected by the virus, and patients who have already recovered from the disease, and also to study the flow of virus from similar health issues. In this paper, an Internet of things (IoT) framework has been developed for the early detection of suspected cases. This framework is used for collecting and uploading symptoms (data) through sensor devices to the physician, data analytics center, cloud, and isolation/health centers. The symptoms of the first wave, second wave, and omicron are used to identify the suspects. Five machine learning algorithms which are considered to be the best in the existing literature have been used to find the best machine learning classifier in this research work. The proposed framework is used for the rapid detection of COVID-19 cases from real-world COVID-19 symptoms to mitigate the spread in society. This model also monitors the affected patient who has undergone treatment and recovered. It also collects data for analysis to perform further improvements in algorithms based on daily updated information from patients to provide better solutions to mankind.

Keywords: Corona virus disease; detection and monitoring; internet of things; machine learning algorithms; treatment history;

Introduction

The World Health Organization (WHO) declared COVID-19, a contagious disease brought back by the SARS virus, a global pandemic in March 2020. Over 129 million people have been infected with COVID-19, and 2.8 million people have died worldwide as a result of the massive outbreak [1,2]. As can be seen in Figure 1, both the number of infections and the number of deaths are rising rapidly. In order to control this natural pandemic, early diagnosis of infected cases is crucial. Advanced intelligent prediction systems and precise modeling of techniques, on the other hand, have made a significant contribution to the management and planning of health resources that are used to fight the virus. The underlying stage conclusion of the infection is additionally valuable for proper patient disconnection, quick canulization of constant patients in unambiguous emergency clinics, and noticing infection spread. However, due to the high cost of diagnostic tests, the diagnosis of COVID-19 is extremely challenging in both developed and developing nations [3].

Application of improved you only look once model in road traffic monitoring system

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Abstract

The present research focuses on developing an intelligent traffic management solution for tracking the vehicles on roads. Our proposed work focuses on a much better you only look once (YOLOv4) traffic monitoring system that uses the CSPDarknet53 architecture as its foundation. Deep-sort learning methodology for vehicle multi-target detection from traffic video is also part of our research study. We have included features like the Kalman filter, which estimates unknown objects and can track moving targets. Hungarian techniques identify the correct frame for the object. We are using enhanced object detection network design and new data augmentation techniques with YOLOv4, which ultimately aids in traffic monitoring. Until recently, object identification models could either perform quickly or draw conclusions quickly. This was a big improvement, as YOLOv4 has an astoundingly good performance for a very high frames per second (FPS). The current study is focused on developing an intelligent video surveillance-based vehicle tracking system that tracks the vehicles using a neural network, image-based tracking, and YOLOv4. Real video sequences of road traffic are used to test the effectiveness of the method that has been suggested in the research. Through simulations, it is demonstrated that the suggested technique significantly increases graphics processing unit (GPU) speed and FSP as compared to baseline algorithms.

Keywords:

Computer vision; intelligent traffic; neural network; traffic analysis; YOLOv3;

Introduction

Traffic monitoring systems, which collect and analyze traffic data to derive statistical information like the number of vehicles on the road and their temporal patterns, are heavily invested in by many nations [1]. These statistics are used by governments to predict the need for transportation, increase the safety of transportation, and plan work on pavement maintenance. Predicting noise levels and road damage is made easier by knowing how big vehicles are. According to the Traffic Monitoring Guide report, which was published by the Federal Highway

Prediction of dementia using machine learning model and performance improvement with cuckoo algorithm

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Abstract

Dementia is a brain disease that stays in the seventh position of death rate as per the report of the World Health Organization (WHO). Among the various types of dementia, Alzheimer's disease has more than 70% of cases of dementia. The objective is to predict dementia disease from the open access series of imaging studies (OASIS) dataset using machine learning techniques. Also, the performance of the machine learning model is analyzed to improve the performance of the model using the cuckoo algorithm. In this paper, feature engineering has been focused and the prediction of dementia has been done using the OASIS dataset with the help of data mining techniques. Feature engineering is followed by prediction using the machine learning model Gaussian naïve Bayes (NB), support vector machine, and linear regression. Also, the best prediction model has been selected and done the validation. The evaluation metrics considered for validating the models are accuracy, precision, recall, and F1-Score and the highest values are 95%, 97%, 95%, and 95%. The Gaussian NB has been given these best results. The accuracy of the machine learning models has been increased by eliminating the factors which affect the performance of the models using the cuckoo algorithm.

Keywords: Classification; dementia; Gaussian naïve Bayes; linear regression; support vector machine;

Introduction

AI (ML) is characterized as the investigation of PC programs that influence calculations and measurable models to learn through induction and examples without being expressly modified [1]. ML calculations learn over experience and improve naturally. It automatically determines the output by finding techniques, training models, and utilizing the learned approach [2]. Systems based on machine learning can also adapt to their surroundings.A model is a machine learning system that has been trained to find particular kinds of patterns with the help of an algorithm [3].

A machine learning model for predicting innovation effort of firms

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Abstract

Classification and regression tree (CART) data mining models have been used in several scientific fields for building efficient and accurate predictive models. Some of the application areas are prediction of disease, targeted marketing, and fraud detection. In this paper we use CART which widely used machine learning technique for predicting research and development (R&D) intensity or innovation effort of firms using several relevant variables like technical opportunity, knowledge spillover and absorptive capacity. We found that accuracy of CART models is superior to the often-used linear parametric models. The results of this study are considered necessary for both financial analysts and practitioners. In the case of financial analysts, it establishes the power of data-driven prototypes to understand the innovation thinking of employees, whereas in the case of policymakers or business entrepreneurs, who can take advantage of evidence-based tools in the decision-making process.

Keywords

Classification and regression tree; data mining; innovation; innovation predictors; machine learning;

Introduction

Because brainstorming can encourage creative thinking through group participation [2], this study used brainstorming techniques to answer these four research questions. In accordance with the participants' agreement regarding the research questions, we invited eleven scholars from various nations and formed two-member brainstorming teams. Each of the eleven participants responded to the four questions with their own opinions and references. As a result, there are no

Deep learning-based switchable network for in-loop filtering in high efficiency video coding

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Abstract

The video codecs are focusing on a smart transition in this era. A future area of research that has not yet been fully investigated is the effect of deep learning on video compression. The paper's goal is to reduce the ringing and artifacts that loop filtering causes when high-efficiency video compression is used. Even though there is a lot of research being done to lessen this effect, there are still many improvements that can be made. In This paper we have focused on an intelligent solution for improvising in-loop filtering in high efficiency video coding (HEVC) using a deep convolutional neural network (CNN). The paper proposes the design and implementation of deep CNN-based loop filtering using a series of 15 CNN networks followed by a combine and squeeze network that improves feature extraction. The resultant output is free from double enhancement and the peak signal-to-noise ratio is improved by 0.5 dB compared to existing techniques. The experiments then demonstrate that improving the coding efficiency by pipelining this network to the current network and using it for higher quantization parameters (QP) is more effective than using it separately. Coding efficiency is improved by an average of 8.3% with the switching based deep CNN in-loop filtering.

Keywords: coding tree unit; convolutional neural network; deep learning; high efficiency video coding; in-loop filtering; video coding;

Introduction

The researchers have demonstrated the deep architecture's viability and efficacy in a variety of contexts thanks to the advancement of the deep learning theory. Image annotation, classification, segmentation, and anomaly object detection are just a few of the applications for which deep kernel learning has been demonstrated to be an effective framework [1, 2]. The adaptive back propagation is used in this deep kernel learning framework to update coefficients and weights of

Towards a new intelligent traffic system based on deep learning and data integration

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Abstract

Time series forecasting is an important technique to study the behavior of temporal data in order to forecast the future values, which is widely applied in intelligent traffic systems (ITS). In this paper, several deep learning models were designed to deal with the multivariate time series forecasting problem for the purpose of long-term predicting traffic volume. Simulation results showed that the best forecasts are obtained with the use of two hidden long short-term memory (LSTM) layers: the first with 64 neurons and the second with 32 neurons. Over 93% of the forecasts were made with less than ±2.0% error. The analysis of variances is mainly due to peaks in some extreme conditions. For this purpose, the data was then merged between two different sources: electromagnetic loops and cameras. Data fusion is based on a calibration of the reliability of the sources according to the visibility conditions and time of the day. The integration results were then compared with the real data to prove the improvement of the prediction results in peak periods after the data fusion step.

Keywords: data integration; deep learning; image recognition; intelligent traffic systems; long short-term memory; multivariate time series; traffic forecasting;

Introduction

The research community has been working on ways to improve the accuracy, efficiency, and effectiveness of intelligent traffic management and control (ITMC) systems, which have emerged as an essential component of traffic management solutions. Traffic state gauge and convergence signal control are two primary parts that ITMC consolidates. There are typically two types of methods, the first of which is based on statistical techniques and data-driven approaches, making it possible to formulate hypotheses and derive assumptions regarding traffic flow from both a macro and microlevel perspective. However, according to Elhenawy and Rakha [2], these methods are unable to deal with unpredictable traffic conditions or intricate road settings. Data-driven approaches, such as Support Vector Machines (SVMs), K-Nearest

Hyper parameters analysis of long short-term memory architecture for crop classification

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Abstract

Deep learning (DL) has seen a massive rise in popularity for remote sensing (RS) based applications over the past few years. However, the performance of DL algorithms is dependent on the optimization of various hyper parameters since the hyper parameters have a huge impact on the performance of deep neural networks. The impact of hyper parameters on the accuracy and reliability of DL models is a significant area for investigation. In this study, the grid Search algorithm is used for hyper parameters optimization of long short-term memory (LSTM) network for the RS-based classification. The hyper parameters considered for this study are, optimizer, activation function, batch size, and the number of LSTM layers. In this study, over 1,000 hyper parameter sets are evaluated and the result of all the sets are analyzed to see the effects of various combinations of hyper parameters as well the individual parameter effect on the performance of the LSTM model. The performance of the LSTM model is evaluated using the performance metric of minimum loss and average loss and it was found that classification can be highly affected by the choice of optimizer; however, other parameters such as the number of LSTM layers have less influence.

Keywords: crop classification; grid search; hyper parameters tuning; multispectral; remote sensing;

Introduction

One of the greatest challenges of the 21st century is the availability of food. Currently, there are 820 million people who are malnourished [1]. In the coming decades, this trend is likely to be exacerbated by two driving forces. First, the world's population is rapidly expanding, reaching 9.7 billion by 2050 [2]. By 2050, it is anticipated that sub-Saharan Africa's population, which is frequently threatened by hunger, will double [2]. Second, the average temperature will rise and precipitation patterns will shift across numerous regions as a result of global warming. Subsequently, occasional harvest disappointments and extremely durable loss of arable land because of desertification are supposed to happen all the more frequently [3]. Advanced agricultural monitoring applications are required to combat these factors. Yield prediction, irrigation models, and production loss forecasts are among the remote sensing applications

Data driven algorithm selection to predict agriculture commodities price

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Abstract

Price prediction and forecasting are common in the agriculture sector. The previous research shows that the advancement in prediction and forecasting algorithms will help farmers to get a better return for their produce. The selection of the best fitting algorithm for the given data set and the commodity is crucial. The historical experimental results show that the performance of the algorithms varies with the input data. Our main objective was to develop a model in which the best-performing prediction algorithm gets selected for the given data set. For the experiment, we have used seasonal autoregressive integrated moving average (SARIMA) stack ensemble and gradient boosting algorithms for the commodities Tomato and Potato with monthly and weekly average prices. The experimental results show that no algorithm is consistent with the given commodities and price data. Using the proposed model for the monthly forecasting and Tomato, stack ensemble is a better choice for Karnataka and Madhya Pradesh states with 59% and 61% accuracy. For Potatoes with the monthly price for Karnataka and Maharashtra, the stack ensemble model gave 60% and 85% accuracy. For weekly prediction, the accuracy of gradient boosting is better compared to other models.

Keywords

Agriculture; ensemble model; machine learning; price forecasting; seasonal autoregressive integrated moving average;

Introduction

The rising accessibility of a lot of farming ware costs authentic information and the need of performing exact anticipating of cost vacillations in farming economy requests the meaning of powerful and effective procedures ready to induce from current perceptions. Linear statistical methods, such as ARIMA models, have traditionally been used to solve the prediction problem; however, more recently, with the development of machine learning techniques, the solution has largely shifted from statistical methods to machine learning. However, only a limited amount of consideration is given to selecting the appropriate set from historical data for forecasting. On the

Classification of electroencephalography using cooperative learning based on participating client balancing

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Abstract

Modern technologies are widely used today to diagnose epilepsy, neurological disorders, and brain tumors. Meanwhile, it is not cost-effective in terms of time and money to use a large amount of electroencephalography (EEG) data from different centers and collect them in a central server for processing and analysis. Collecting this data correctly is challenging, and organizations avoid sharing their and client information with others due to data privacy protection. It is difficult to collect these data correctly and it is challenging to transfer them to research centers due to the privacy of the data. In this regard, collaborative learning as an extraordinary approach in this field paves the way for the use of information repositories in research matters without transferring the original data to the centers. This study focuses on the use of a heterogeneous client balancing technique with an interval selection approach and classification of EEG signals with ResNet50 deep architecture. The test results achieved an accuracy of 99.14 compared to similar methods.

Keywords: Client balancing; cooperative learning; electroencephalography; ResNet50;

Introduction

An electroencephalogram, or EEG, is a test that looks at the brain's electrical activity. Electrical impulses are what brain cells use to communicate. EEG had been designed by Hans Berger in 1924. A brain electroencephalogram is used to look for problems with the brain's electrical system. An EEG's measurements enable us to examine and rule out a variety of conditions

Classification of electroencephalography using cooperative learning based on participating client balancing

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Abstract

Modern technologies are widely used today to diagnose epilepsy, neurological disorders, and brain tumors. Meanwhile, it is not cost-effective in terms of time and money to use a large amount of electroencephalography (EEG) data from different centers and collect them in a central server for processing and analysis. Collecting this data correctly is challenging, and organizations avoid sharing their and client information with others due to data privacy protection. It is difficult to collect these data correctly and it is challenging to transfer them to research centers due to the privacy of the data. In this regard, collaborative learning as an extraordinary approach in this field paves the way for the use of information repositories in research matters without transferring the original data to the centers. This study focuses on the use of a heterogeneous client balancing technique with an interval selection approach and classification of EEG signals with ResNet50 deep architecture. The test results achieved an accuracy of 99.14 compared to similar methods.

Keywords

Client balancing; cooperative learning; electro encephalography; ResNet50;

Introduction

The use of electroencephalography (EEG) signals in the form of waves is now the most important method for diagnosing brain disorders and anomalies[1–3]. Intense cerebrum exercises of epileptic patients, for example, seizures spread as rushes of electrical signs. A unique type of waves is seen in the EEG sign of patients who have a mind sore brought about by a cancer in the cerebrum and furthermore have a stroke contingent upon the area of their lesion[4]-[7]. EEG has been used to accurately diagnose a variety of brain diseases for a long time[8]. In any case, every

Hybrid iterated local search algorithm for optimization route of airplane travel plans

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Abstract

The traveling salesman problem (TSP) is a very popular combinatorics problem. This problem has been widely applied to various real problems. The TSP problem has been classified as a Non-deterministic Polynomial Hard (NP-Hard), so a non-deterministic algorithm is needed to solve this problem. However, a non-deterministic algorithm can only produce a fairly good solution but does not guarantee an optimal solution. Therefore, there are still opportunities to develop new algorithms with better optimization results. This research develops a new algorithm by hybridizing three local search algorithms, namely, iterated local search (ILS) with simulated annealing (SA) and hill climbing (HC), to get a better optimization result. This algorithm aimed to solve TSP problems in the transportation sector, using a case study from the Traveling Salesman Challenge 2.0 (TSC 2.0). The test results show that the developed algorithm can optimize better by 15.7% on average and 11.4% based on the best results compared to previous studies using the Tabu-SA algorithm.

Keywords: hyper-heuristic; iterated local search; simulated annealing; traveling salesman challenge 2.0; traveling salesman problem;

Introduction

The Printed Circuit Board (PCB) is an essential component of monitors, laptops, and other electronic devices. It has a lot of moving parts and gets more and more complicated. PCBs go through a number of steps in a typical assembly line for surface mount technology, including: application of adhesive or solder; part pick-and-spot; reflowing; cleaning; testing; also, review [1]. The pick-and-spot process is the most tedious methodology. The pick-and-place sequence

Internet of things-enabled smart controller for polymer dispersed liquid crystals films

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Abstract

The evolvement of smart glass technology has gained a lot of interest through its energy-saving potential as one of the heating, ventilating, and air-conditioning (HVAC) system. This paper focuses on polymer dispersed liquid crystal (PDLC) film, a smart glazing film that changes its opacity in response to an electrical impulse. The power consumption of the smart film is considerably small. However, improper handling of the smart film such as not turning off the film after usage can lead to energy wastage. Hence, connecting the smart film to an internet of things (IoT) controller would be one of the possible solutions to ensure that the film is maintained properly. The objective of the work here is to develop a smart, low cost and efficient IoT-enabled smart controller for PDLC films with energy-saving features. In pursuance of materializing this concept, this paper delineates the design of a smart controller for the PDLC films. The implementation of the IoT features, NodeMCU, and environmental sensors enabled the smart film to be capable of switching automatically. In addition, voice-command features were also incorporated into the controller. With the successful development of the IoT smart controller, the PDLC films can operate autonomously and wirelessly.

Keywords: blynk application; if this then that; internet of things; light dependent resistor; passive infrared sensor; smart controller; voice-command control;

Introduction

It is essential to have an efficient system for keeping track of security in the home and environment due to the rising prevalence of burglaries, personal threats to home occupants, and property damage. Priority should be given to ensuring the safety and security of lives and property. Hence, a home ought to be outfitted with a savvy framework to screen from a distance, control, and report exercises to the tenant. To accomplish security, wellbeing, comfort, and

An empirical study on Cloud security:

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Abstract

Today, the growth of digitalization has made the ease for livelihood for all the organizations. Cloud computing the storage provider for all the computer resources has made it easy for accessing the data from anywhere anytime. But at the same time the security for cloud data storage is the major drawback which is provided by various cryptographic algorithms. These algorithms convert the data into unreadable format, known as cipher text, Rivest, Shamir and Adleman (RSA) one of the most popularly used asymmetric algorithm. This paper gives detailed review about such different cryptographic algorithms used for the cloud data security. The comparison study is also made for the size of data and to analyze the encryption time and decryption time, which concludes that to enhance the cloud data security some addon techniques are to be used along with these cryptographic algorithms. To increase the security level and to increase the transmission speed of plaintext, integrated method will be proposed by encoding the plaintext to intermediate plaintext and then intermediate plaintext will be compressed using any one of the compression techniques to increase the compression ratio, lastly the compressed file is encrypted to further enhance the security level.

Keywords

Cloud computing; cloud data security; decryption; encryption; rivest, shamir and adleman;

Introduction

Internet computing is also known as cloud computing. The meaning of distributed computing given by Public Foundation of Guidelines and Innovation (NIST) says that: " On-demand and convenient network access to a shared pool of configurable computing resources (such as networks, servers, storage applications, and services) that can be quickly provisioned and

Virtual machine placement in cloud using artificial bee colony and imperialist competitive algorithm

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Abstract

Increasing resource efficiency and reducing energy consumption are significant challenges in cloud environments. Placing virtual machines is essential in improving cloud systems' performance. This paper presents a hybrid method using the artificial bee colony and imperialist competitive algorithm to reduce provider costs and decrease client expenditure. Implementation of the proposed plan in the CloudSim simulation environment indicates the proposed method performs better than the Monarch butterfly optimization and salp swarm algorithms regarding energy consumption and resource usage. Moreover, average central processing unit (CPU) and random-access memory (RAM) usage and the number of host shutdowns show better results for the proposed model.

Keywords

Artificial bee colony algorithm; cloud computing; imperialist competitive algorithm; virtual machine placement; virtualization;

Introduction

With the development of distributed computing, cloud suppliers tend to virtualize a scope of telecom administrations by spreading the distributed computing innovation toward end clients and conveying versatile client's network as a cloud administration. The "Follow Me Cloud" (FMC) concept, which enables services to migrate and seamlessly follow users' mobility, is proposed by the authors of [63] in this context. As a result, services are typically provided from storage computer positions that are adequate for the prevalent user placement and current network state. FMC's central premise is that users are pursued by services throughout their mobilizations. The "follow-me cloud" strategy can be implemented using a variety of

Approaches for smart linear regression in a difficult quasi economic dispatch problem

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Abstract

Traditional methods indispensably necessitate monotonically increasing characteristic for fuel cost of generators in a thermal power plant. However, in medium and large thermal power plants, this condition is a dream to accomplish. So, to meet out these exigencies heuristic methods like swarm optimization technique, genetic algorithm technique and bee colony based hybrid solar thermal technology (BHSTT) are used to realize the practical nonlinearities associated with valve point loading emanated out of multi-valving effect, associated with power station. However, the heuristic methods too face challenges arising out of bulky thermal power plants adopting cubic cost functions and possessing stringent non-convex economic dispatch problem following multi-valving and erratic behavior of nonlinear loads at the load center. So, at its favor function evaluation method dealing with cubic cost function is attempted in this dissertation to yield a satisfactory optimal solution for economic dispatch problem. This method deals with the real power generation of producing units as well as the complex power of units, as well as dealing with severe nonlinear stringent fuel cost characteristics that are prevalent in today's bulky thermal power plants. In comparison to previous approaches, the findings achieved are highly encouraging.

Keywords

Linear regression, Quasi economic dispatch; Bee colony-based hybrid solar thermal technique; economic load dispatch; quartic equation; sine cosine.

Introduction

Direct Relapse is one of the simplest and most famous Managed AI calculations. It is a method that uses independent factors to predict a target value. The majority of applications for linear regression include forecasting and establishing cause-and-effect relationships among variables. The Linear Regression algorithm's Python implementation is covered in this article. We will also

A study on Binpacking Approximation Algorithm

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Abstract

The main objective of this problem is to pack objects of fixed volume into bins, each of them having a maximum capacity, so as to minimize the total number of bins used. Binpacking is an Np-complete problem as the number items increases, to pack the items in n bins, It cannot be done in polynomial time. Hence we convert the Np problem to P problem in our approach. There are several methods to solve this problem. The most straightforward solution would be the first fit algorithm. Here each object is compared against all the bins to try find the first bin which could accommodate the object. Insert a set of n numbers into as few bins as possible, such that the sum of the numbers assigned to each bin does not exceed the bin capacity, we firstly prove it to be NP problem and solve as P problem after transformation.

Keywords - NP complete, P complete, Bin Packing

Introduction

Numerous industrial applications are represented by the 2D Bin Packing problem.It is utilized in numerous fields, including cloud resource allocation and industrial logistics. The problem, in its earliest form, asks for the best way to combine a set of rectangles into a larger square or rectangle that uses the fewest resources. Because it is merely a generalization of the NP-Complete 1D Bin Packing Problem, the 2D Bin Packing Problem (BPP) is strongly NP-Hard.

A Study OnBuffer Overflow Attack and Detection

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Abstract

Exploits, vulnerabilities, and buffer-overflow techniques have been used by malicious hackers and virus writers for a long time. In order to attack and get the remote root privilege, using buffer overflow and suidprogram has become the commonly used method for hackers. This paper include vast idea and information regarding the buffer overflow as history of Vulnerabilities, buffers, stack, registers, Buffer Overflow Vulnerabilities and Attacks, current buffer over flow, Shell code, Buffer Overflow Issues, the Source of the Problem, prevention/detection of Buffer Overflow attacks and Finally how to react towards Buffer Overflows. The objective of this study is to take one inside the buffer overflow attack and bridge the gap between the "descriptive account" and the "technically intensive account"

Introduction

Overflowing buffer Nowadays, the term "buffer overflows" is often used interchangeably with "vulnerabilities" or "exploits" in information technology circles. It can enter the security water cooler discussions faster than McAfee's new wicked anti-virus software or Symantec's newest acquisition, and it is not only a frightening word that can keep you up at night wondering if you purchased the best firewalls, correctly configured your new host-based intrusion prevention system, and have patched your entire environment. Buffer overflows demonstrate that the software programming or computer science community still lacks a firm understanding of how to design, create, and implement secure code.

Performance analysis of Dropped Packets for Location Aided Routing Protocol Using Artificial Intelligence

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Abstract

Location aided routing protocol (LAR) is an on demand protocol in MANET which uses GPS in mobile nodes to find the location of node. It calculates routing when it is needed. LAR protocol has two zones namely expected zone and request zone. The expected zone is circular in shape while request zone is rectangular in shape. Expected zone is determined according to the location of destination and request zone is determined according to the location of source node. When communication starts between sources to destination, the node is not within expected zone; packet is dropped. Therefore, packet is lost or destroyed. This paper proposed a method for dropped packet which randomly checks exactly how many packets is dropped during transmission. This paper proposed an algorithm for wireless LAN.

Keywords: Expected zone, GPS, MANET, Request zone, Wireless LAN.

Introduction

In wireless sensor networks (WSNs), objectives like effective energy management, high availability and reliability, communication security, and robustness have emerged as crucial considerations. This is one of the many reasons why we cannot disregard the investigation of the crash impacts and the commotion impact.We present in this paper a new steering calculation which presents fake knowledge (computer based intelligence) procedures to quantify the nature of administration (QoS) upheld by the organization

Token Sequencing Approach in SQL Injection Attacks

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Abstract

Internet, the network of networks represents an insecure channel for exchanging information leading to a high risk of intrusion or fraud. Many web applications remain under the attack of hackers who intentionally try to access secret information stored at the backend database by circumventing its security system. One of the major approaches followed to perform these attacks is with the help of SQL Injection (SQLI) or (SQLIA). SQL injection is a technique used to attack databases through a website. It is a form of attack that comes from user input that has not been checked to see if it is valid. SQL injection is the subset of code which is not verified by the backend server and the aim is to run that code to derive the secret information.[1]. In this papera method is proposed in which two approaches, one static in which the database is created and another dynamic in which the query structure against the previously stored query structure is compared. If the two structures match then search is stopped and query is regarded as a valid query. The Algorithm has been developed in JAVA.

Keywords-Group, Malicious, SQLIA, Token, Vulnerability

Introduction

Web applications are extremely vulnerable to SQL injection. As of late, with the development of web, data sets have become significantly more significant than any time in recent memory and are a basic piece of organization security. A website's database is its storage brain.[1] Passwords and other crucial information, such as credit card numbers and account numbers, come from a compromised database. Significance ought to be given for forestalling data set double-dealing by SQL infusion. [1] [6] some work has already been done to stop this attack. The strategies utilized before are awkward, as the need might arise to change the source code which is an above, additionally it limits the runtime response time .In this methodology there is compelling reason

SIMULATION OF SOFTWARE DEFINED NETWORKS WITH OPEN NETWORK OPERATING SYSTEM AND MININET

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Abstract

With the emergence of recent technologies in the field of computer network, traditional infrastructure in the field of networks have become obsolete and incompatible with respect to the new architectures of open networks that emerge with force. This is how software-defined networks emerge by enabling cloud computing ecosystem, enterprise data centers, and telecommunications service providers. The major contribution of this paper is the simulation of an ecosystem based on a software defined network by making use of certain types of networks topologies and using the virtualization of the open network operating system (ONOS) and Mininet as a network emulator.

KEYWORDS

Computer Network, Software-defined Networks, Network Topologies, Simulation, Open Network Operating System.

Introduction

The product is decoupled from the equipment. SDN leaves the data plane, which actually forwards traffic in hardware, and moves the control plane, which decides where to send traffic, to software. Software-defined networking network administrators can now program and control the entire network from a single pane of glass rather than by device.

USABILITY ANALYSIS IN MILITARY SETTINGS: COMMUNICATION, DECISION MAKING AND OPERATIONS

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Abstract

Both the market and academia strongly encourage the development of usable systems, and they do so by relying on a number of standards, guide-lines, research and good practice streams. Unfortunately, the military sector, whilst being the owner of standards under many purposes and topics, seems still falling and running behind as the conceptual issues and practical implications of usability are concerned. In our paper, usability has been analytically investigated throughout a simulated military operation setting and against a mock-up prototype wearable computing device, and several provoking conclusions in terms of "rethinking usability" applied to military operations and decision making have been derived. We expect that many stakeholders from within the whole sector (the "defense" industry) can leverage this study as a first step to challenge existing cultural, political, economic and even ethical biases and constraints acting against the full exploitation of usability potential. .

KEYWORDS: HCI, Military Device, Prototyping, Wearable Computer, Usability

Introduction

Legitimate convenience estimation can't happen outside the client's specific situation, and usable frameworks require this setting be integrated into the advancement cycle. While considering instruments, for example, rules and agendas for client focused plan, Bevan and Macleod (1994) cautioned against reliance on agendas, since rules for usable framework highlights need broad detail to be helpful, however in the event that agendas are sufficiently definite, they are probably going to be excessively intended for apply in numerous certifiable settings. For instance, an exceptionally intuitive online presentation the executives assessment structure that requires successive correspondence with a server to finish might be helpful in an office setting

since it will permit the client's information to be saved through numerous interferences. On the other hand, since a deployed Navy ship's satellite Internet connection may be intermittent or nonexistent, this strategy might not be ideal. Scenario-based assessments that simulate actual user environments are the solution. It is possible to create a realistic environment in a laboratory, but the most realistic method is to carry out usability testing in the real world. To Dumas and

A HIERARCHICAL TEST CASE PRIORITIZATION TECHNIQUES FOR ASPECTORIENTED SOFTWARE

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Abstract

Aspect Oriented Programming (AOPP) is a brand-new approach to software development. This is the method for modularizing cross-cutting issues. The testing of AO programs is one of the difficulties it presents because it is still in its developing stage. A new testing strategy is required for AO programs due to the fundamental differences between AOP and OOP. State-based incremental testing is one way that AO programs are tested. Each aspect-class block is tested one at a time. Regression testing is required as the number of aspects increases in order to guarantee that the integration does not alter the class's original behavior. During state-based incremental testing, one of the most significant issues is: as the quantity of angles to be added expands, the quantity of experiments on which relapse testing must be performed likewise increments dramatically. Extensive testing is required in this scenario, which is not only impractical but also inefficient. A new framework for state-based incremental testing of the Aspect Oriented Program has been proposed in the work that was presented. Hierarchical Test Case Prioritization (HTCP) in State-based Incremental Testing for Aspect Oriented Programs is a brand-new algorithm that has been proposed in light of the work's primary goal of increasing the effectiveness of regression testing. At the first level, HTCP takes into account hierarchical prioritization with the objective of maximizing the rate of fault detection. At the second level, the objective is to increase the rate of fault detection by locating high-risk faults earlier in the testing process. The framework was evaluated and analyzed using the Average Percentage of Faults Detection (APFD) metric. The Prioritization Test Suite, which is the result of proposed HTCP algorithms, and the Non-prioritized Test Suite are compared for the analysis.

KEYWORDS: HTCP, AOP, APFD, AO, and OOP

Introduction

Testing is a significant part during the product improvement cycle, associations and organizations generally pay a great deal of work to the testing system to find out comes up short and blunders of elements/capabilities, which is a vital stage in the advancement pattern of programming and can work on the nature of the programming item [1] [2].However, testing is a costly method of verification. Software companies typically outsource software testing to save

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, and Risk Assessment for Authentication

Introduction

Online services still use passwords as their primary form of authentication [23]. Be that as it may, dangers to secret key based verification are expanding, e.g, by enormous scope secret word data set breaks 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. Two-factor verification (2FA) is one such measure which is broadly utilized however has shown

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 Perceptron 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 Perceptron 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 neurocognition, 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, specialists are taking a gander at subject independent mental undertaking groupings. Analyses of the effects of diseases on brain function suggest BCI for

COMPARATIVE ANALYSIS OF TWO ALGORITHMS FOR CLASSIFICATION OF INTRUSION ATTACKS WITH THE USE OF THE KDD CUP DATASET

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Abstract

In today's interconnected world, one of the most pressing concerns is how to safeguard a system from intrusion-based security attacks. The importance of an intrusion detection system (IDS) to the security of a computer network is well-established. When developing an intrusion detection system, the mining approach may play a crucial role. Data mining relies heavily on classification as a method. The effectiveness of two well-known attack classification algorithms is evaluated in this paper. The J48 algorithm and the Bayes net are looked at. The main ideas are to use data mining techniques effectively to classify intrusion attacks.

KEYWORDS: J48 Classification Algorithm, Bayes Net, and the Intrusion Detection System

Introduction

The Internet of Things (IoT) and cyber-physical systems (CPS) have significantly increased our capacity to comprehend our ecosystem and the world around it. Large, interconnected devices like industrial machines and smart cars are frequently referred to as CPS. Conversely, IoT is much of the time used to allude to little, interconnected gadgets,

for example, those in a brilliant home [1]. Because of its numerous applications, IoT technology has affected almost every aspect of daily life. As a result of adopting the IoT "know-how" of several life, which has the capability to collect, harvest, and investigate data concerning the surrounding environment [2], our quality of life has significantly improved.

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 multipleinput 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.

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

Introduction

Delivering high-quality of-service (QoS) wireless access at a high data rate will be the primary obstacle that future wireless communication systems must overcome .Joined with the realities that range is a scant asset and engendering conditions are unfriendly because of blurring (brought about by disastrous expansion of multipath parts) and obstruction from different clients, this prerequisite calls for means to increment unearthly proficiency drastically what's more, to further develop interface dependability. The technology known as multiple-input multiple-output (MIMO) wireless [1] appears to satisfy these requirements by providing improved link reliability

Bounds for Approximation in Hierarchical Clustering

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Abstract

Average Linkage, Bisecting K-means, and Local Search Hierarchical clustering is a decades-old data analysis technique. Even though it is used a lot, the method doesn't have a strong analytical foundation. The current approaches would be supported and future enhancements would be guided by a well-understood base. This paper aims to provide an analytical framework for better comprehending practical observations. The dual of Dasgupta's problem framework for hierarchical clustering is the subject of this paper. The main result is that average linkage agglomerative clustering, one of the most widely used algorithms, has a small constant approximation ratio for this goal. In contrast, this paper demonstrates that bisecting k-means divisive clustering, among other well-known algorithms, has a very low lower bound on its approximation ratio for the same goal. However, by providing two constant approximation algorithms, we demonstrate that there are divided algorithms that accomplish this goal successfully. For a natural objective function, this paper provides some of the earliest guarantees on widely used hierarchical algorithms. What these popular algorithms are optimizing and when they will perform well are revealed by this objective and analysis.

Keywords: K-means, divisive clustering

Introduction

A common approach to data analysis is hierarchical clustering. Observe Murtagh and Contreras Krishnamurthy et al. (2012); Heller and Ghahramani (2005) for an outline and pointers to significant work. One is given a set of n data points and an idea of how similar the points are in a typical hierarchical clustering problem. A hierarchy of clusters from the input is the output. In

MODELING A PROTOCOL WITH COLOURED PETRI NETS

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Abstract

Colored Petri nets are an important tool for system modeling in the fields of discrete events and dynamic systems. It is a significant device for simultaneous framework displaying and examination. A combination model that can be shown on a graph is this one; It can visually convey system-wide relations of concurrency, sequence, and synchronization. This paper investigated basic convention utilizing Shaded Petri net. First, the term "colored petri net" was defined, then the "working principle" of the "simple protocol" was explained, and finally, the "simple protocol" was modeled using "colored petri nets" in this paper.

KEYWORDS: CPNTool, colored Petri nets, an occurrence graph, and a state table

Introduction

In order to enhance the capabilities and performance of networking technologies, numerous brand-new communication protocols have been developed in recent years. To ensure that the protocol operates correctly and without undesirable or unsafe behavior, it is essential that the design of the protocol be demonstrated to be error-free. Formal techniques are appropriate to convention plan exercises [1]; Once a protocol is introduced into the network, they can boost confidence that the design is free of errors that would cost a lot of money to fix. However, no upcoming standards will use formal methods for protocol verification because they are expensive, time-consuming, and have a steep learning curve. By automating the process of creating an executable formal model of common protocols, the goal of this study is to close this gap.

A UNIQUE SCHEME OF DATA EMBEDDING THROUGH STEGANOGRAPHY AND CRYPTOGRAPHY

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Abstract

The privacy of data transferred between network nodes is the subject of numerous studies. Cryptography, on the other hand, has always been the best way to safeguard data. For the purpose of safeguarding the data that is going to be transmitted, we propose a method that combines steganography and cryptography. Permutation algorithms applied to original images encrypt and embed into image format in the current system. The secret message in the proposed system is in the form of text or image. The DES, Triple, and RSA permutation algorithms are used for password protection. These algorithms convert secret messages and passwords into binary code, which can then be embedded in media file formats like audio, video, and video. Encoding is reversed during decoding. The secret message file is extracted from the hidden file using keys.

KEYWORDS: JPEG, steganography, cryptography, and data concealment

Introduction

The availability of both public and private digital data, as well as the widespread use of the Internet, has prompted researchers and professionals in the industry to pay close attention to information security. Internet users frequently need to store, send, or receive private information. Unauthorized access and attacks must be prevented to this private information. As of now, three primary strategies for data security being utilized: steganography, cryptography, and

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 willde 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

In several industries, including as cybersecurity, fraud detection, and medical diagnostics, anomaly detection is a crucial duty. Reconstruction probability-based methods, which train a machine learning model to recreate typical data and use the reconstruction error to detect anomalies, are one method for detecting anomalies.For reconstruction probability-based anomaly detection, neural networks called variational auto-encoders (VAEs) can be employed. The latent space, which VAEs learn as a compressed representation of the input data, is used to reconstruct the input data.A VAE can be trained on normal data and then used to reconstruct both normal

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

With limited training data, inference based on deep learning techniques that ignores uncertainty can result in over-confident predictions (Reinhold et al., 2020). Measuring vulnerability is especially significant in basic applications like clinical determination, where a sensible evaluation of vulnerability is fundamental in deciding illness status and proper treatment. In this section, we address the significant issue of learning uncertainty for statistically informed inference. Unaided learning approaches, for example, the Variational auto encoder (VAE) (Kingma and Welling, 2013) and its variations (Makhzani et al., 2015) can approximate high-dimensional data's underlying distribution. The objective function for training VAEs is the

Education and developing an intelligent

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Abstract

Education and developing an intelligent, self-adaptable application to support children are the future of a country's society. Because there are numerous benefits to teaching children, they should receive all-round educational development. They are strong and content when they are educated, so they can face any challenge. To put it another way, a nation's growth is dependent on its educated population. Children with special education needs struggle to acquire new information and concepts, think critically, and develop their cognitive skills. It might also be necessary to work on their behavior, communication abilities, and interactions with their surroundings. It is necessary to develop adaptable, compliant applications that will assist them in adapting to their current circumstances and taking appropriate action. These applications would assist them in defining their learning objectives and processing a variety of sensory and cognitive impairments, including mobility issues. This exploration will be founded on man-made brainpower idea and will be self-versatile. In addition, because the interface and content of the activities have been tailored specifically to them, they frequently have the opportunity to participate in activities that were previously out of their reach. The study also suggests that the variety of activities offered is appropriate for teaching students with disabilities. Lastly, they pay more attention and are more interested in learning when they use electronic devices and multimedia content.

Introduction

The idea of man-made consciousness has drawn in a great deal of consideration in the general public since it was referenced during the 1950s. It is now a relatively mature technology with significant growth potential in the future. Artificial intelligence is now at the forefront of

A SEMANTIC RETRIEVAL SYSTEM FOR EXTRACTING RELATIONSHIPS FROM BIOLOGICAL CORPUS

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Abstract

The World Wide Web holds a large size of different information. Sometimes while searching the World Wide Web, users always do not gain the type of information they expect. In the subject of information extraction, extracting semantic relationships between terms from documents become a challenge. This paper proposes a system helps in retrieving documents based on the query expansion and tackles the extracting of semantic relationships from biological documents. This system retrieved documents that are relevant to the input terms then it extracts the existence of a relationship. In this system, we use Boolean model and the pattern recognition which helps in determining the relevant documents and determining the place of the relationship in the biological document. The system constructs a term-relation table that accelerates the relation extracting part. The proposed method offers another usage of the system so the researchers can use it to figure out the relationship between two biological terms through the available information in the biological documents. Also for the retrieved documents, the system measures the percentage of the precision and recall.

KEYWORDS: Inverted list, information retrieval, Gene Ontology, Information extraction, Relationship extraction, Pattern recognition.

Introduction

Textual information and data from biological experiments are growing at a rapid rate in today's world. As a result, accessing biological data becomes difficult. Information retrieval systems are now essential for biomedical digital libraries. Information retrieval (IR) aids in the user-specific retrieval of documents. An ontology is always defined as a consistent conceptualization of a particular domain that is human- and machine-readable.The most valuable bio-ontology is Gene

OPEN SOURCE TECHNOLOGY: AN EMERGING AND VITAL PARADIGM IN INSTITUTIONS OF LEARNING IN KENYA

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Abstract

Open Source Software is the major rival in the software market previously dominated by proprietary software products. Open Source Software(OSS) is available in various forms including web servers, Enterprise Resource Planning systems (ERPs), Academic management systems and network management systems and the development and uptake of such software by both commercial and non-commercial companies and institutions is still on the rise. The availability of OSS applications for every common type of enterprise, minimal licensing issues and availability of source code as well as ease of access has made the technology even more attractive in learning and teaching of software based courses in institutions of learning. Through embracing this technology, institutions of learning have been able to minimize general operations cost that could have otherwise been incurred in procuring similar proprietary software. Students and teaching staff can nowadays interact and modify the readily available source code hence making learning and teaching more practical.

KEYWORDS Information and Communication Technology (ICT), Apache Internet Information Server (IIS), MYSQL,

Introduction

In Kenyan and international academic institutions, open source technology has become a crucial paradigm. Software that is publicly accessible for use, modification, and dissemination is referred to as open source. Due to the numerous advantages it provides for both educators and students, this technology is becoming more and more significant in education.One of open source technology's main advantages for education is that it makes expensive access to high-

COMPUTER VISION-BASED FALL DETECTION METHODS USING THE KINECT CAMERA: A SURVEY

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Abstract

Disabled people can overcome their disabilities in carrying out daily tasks in many facilities. However, they frequently report that they experience difficulty being independently mobile. And even if they can, they are likely to have some serious accidents such as falls. Furthermore, falls constitute the second leading cause of accidental or injury deaths after injuries of road traffic which call for efficient and practical/comfortable means to monitor physically disabled people in order to detect falls and react urgently. Computer vision (CV) is one of the computer sciences fields, and it is actively contributing in building smart applications by providing for image/video content "understanding." One of the main tasks of CV is detection and recognition. Detection and recognition applications are various and used for different purposes. One of these purposes is to help of the physically disabled people who use a cane as a mobility aid by detecting the fall. This paper surveys the most popular approaches that have been used in fall detection, the challenges related to developing fall detectors, the techniques that have been used with the Kinect in fall detection, best points of interest (joints) to be tracked and the well-known KinectBased Fall Datasets. Finally, recommendations and future works will be summarized.

KEYWORDS: Fall Detection, Kinect camera, physically disabled people, Mobility aid systems

Introduction

Calculating various aspects of the body that is under surveillance is the foundation of the traditional fall detection methods. These frameworks comprise of human shape examination through extricating the shape elements and involving them for the order reason and stance as fall.

INTEGRATING ONLINE LEARNING HYBRID APPROACH WITH A FACE-IDENTIFICATION SYSTEM

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Abstract

One of the most intriguing and exciting areas of research in recent years has been facial recognition. It includes numerous face-based calculations such as facial location, facial arrangement, facial portrayal, and facial acknowledgment. However, the fact that all of these algorithms are based on massive deep-learning architectures limits their development, scalability, accuracy, and availability for public use on CPU-only servers. Additionally, for training purposes, large data sets with hundreds of thousands of records are frequently required. We propose a complete pipeline for an efficient face-recognition application in this paper that eliminates the need for GPU devices and relies only on a small data set of Vietnamese celebrities for training. The pipeline addresses the issue of online facial recognition learning by combining Elastic search's indexing and retrieval process with a face vector to string token conversion algorithm. Our proposed pipeline not only outperforms other well-known algorithms on the same data set in terms of accuracy, but it also delivers faster inference, which is crucial for real-time applications.

Keywords: include facial recognition, a visual search engine, end-to-end applications, online learning, and elastic search (ES).

Introduction

Today, computer vision is a very exciting area of research with methods based on massive, powerful computing systems and useful problems for practical use. The methods for identifying people based on their physical characteristics or behavior are extensively studied and used in identification systems. Particularly, facial recognition has been the subject of numerous studies and applications. Every person in the world has their own distinct features on their faces. As a result, it is comparable to one's own identity. Therefore, unique facial recognition should be used for identity verification and control in a variety of applications, including vehicle driver authentication and online learning systems (or e-learning). 3, 6].

Robust Load Balancing with Machine Learned Techniques

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Abstract

We present and investigate a theoretical model for load balancing of very large databases, such as those used by commercial search engines, in light of the explosive growth of web-based services and the significance of effectively managing these systems' computational resources.

With an additional constraint that restricts the number of servers that carry each piece of data, our model is a more realistic version of the well-received balls-into-bins model. When the data is so large that we cannot copy it all to each server, this additional restriction is necessary. On the other hand, because the query response time is so short, we can't ignore the fact that the number of queries for each piece of data changes over time. As a result, we can't just divide the data between different machines. Given an estimate of the load of each piece of data, we develop an almost optimal load balancing algorithm in this paper. The performance of our algorithm is 1 1/e, which is provably optimal, even when all of the loads are adversarially chosen. This demonstrates that our algorithm is almost completely resistant to incorrect estimates. Along the way, we create a novel connection with the multiplicative weights update scheme and develop various methods for analyzing the balls-into-bins process under certain correlations.

Keywords: Machine learning prediction, online algorithm, learning augmented algorithm design, load balancing, balls and bins

Introduction

Highly dense cellular networks have emerged as a connectivity option for large-scale IoT applications as a result of the proliferation of Internet-connected wireless devices, the Internet of Things (IoT), and machine-to-machine (M2M) communications paradigms. These various wireless devices include small ones like sensors, actuators, wearable electronics, and others as well as more powerful ones like smart phones. There have been a number of suggestions for reducing the congestion that exists in dense wireless networks. Heterogeneous networks, for instance, have been conceptualized.

A study on Distance and Kernel Measures of Conditional Dependence

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Abstract

The measurement of conditional dependence is fundamental to causal discovery, feature selection, dimensionality reduction, Bayesian network learning, and other areas of statistical inference. We investigate the connection between reproducing kernels associated with a reproducing kernel Hilbert space (RKHS) and conditional dependence measures induced by distances on a metric space in this work. For specific distance and partmatches, we show the distance-based restrictive reliance measures to be comparable tothat of part based measures. On the other hand, we demonstrate that, with the exception of a few limiting cases, some well-known kernel conditional dependence measures based on the Hilbert-Schmidt norm of a particular crossconditional covariance operator lack a straightforward distance representation.

Keywords: Reproducing kernel Hilbert space, conditional independence test, distance covariance, energy distance, and the Hilbert Schmidt independence criterion.

Introduction

The Conditional Independence (CI) test is a statistical hypothesis test that looks at whether the actual values of the three variables—X, Y, and Z—are conditionally independent given another variable Z. In Bayesian network structure learning [1,2] and causal discovery [3,] the CI test is very important.

A Comprehensive Review of the Literature on Human Ear Biometrics:

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Abstract

Trends, Methods, and Approaches Over the Last Decade As a real development tool, biometric technology is rapidly expanding. Until now, biometric procedures have mostly been used to verify identity, and ear recognition methods continue to offer very solid research opportunities. Using a few parameters, this paper proposes to identify and evaluate existing ear biometrics methods: machine learning techniques, procedures, and directions for future research are provided. 1121 publications were retrieved from ten databases, including Science Direct, ACM, Wiley, IEEE, Springer, Emerald, Elsevier, Sage, MIT, and Taylor & Francis. Some articles were excluded based on abstract eligibility, duplicity, and uncertainty (indeterminate method) in order to obtain relevant materials. Consequently, 73 papers were chosen for comprehensive analysis and significance. Using search strategies, the identified works underwent a quantitative analysis: status, architecture, datasets, technique, and source.

Keywords: biometric systems; systems for recognizing ears; extraction of features; order strategies; network of convolutional neurons; limited Boltzmann apparatus

Introduction

More than 1.5 billion people worldwide lack proper identification [1]. Because it is a major requirement for achieving the Sustainable Development Goals (SDG), establishing a person's identity and the privileges that go along with it is becoming a growing cause for concern for governments all over the world. In today's societies, a formal method of personal identity verification is an essential requirement. The failure to lay out one's personality can altogether hamper admittance to fundamental freedoms, government, and other fundamental administrations.

Application-based biomedical signal processing for health monitoring: a review

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Abstract

Biomedical wellbeing observing frameworks are advancing quickly and utilizing painless and practical sensors. These systems can keep track of the body's physiological parameters to keep an eye on health conditions and give feedback. Intelligent systems for health monitoring and timely disease detection and diagnosis can be built using cutting-edge technologies in these new generation systems. The field of biomedical signal processing and pattern analysis is growing quickly because it is crucial to the development of effective systems, life sciences, and research. Because there is no other review paper that covers all biomedical signal processing phases, this one is significant. Four contributions are made by it: In the first place, it provides an activity flow for the creation of biomedical signal processing systems. Second, discusses a variety of recently investigated applications and low-cost, non-invasive health monitoring sensors. Third, the classification and inclusion of healthcare-specific signal processing methods like segmentation, filtering, feature extraction, dimensionality reduction, and machine learning. Fourthly, it examines the obstacles that arise when employing signal processing methods and offers predictions for the future, which may be of assistance to researchers as they employ cutting-edge methods to construct intelligent systems that can make accurate decisions.

Keywords: processing of medical signals; pre-processing of signals; biological indications; review.

Introduction

Researchers have been drawn to the field of brain-computer interface (BCI) development, which uses brain activity to create solutions for computers and other devices. In order to assist people with special needs in carrying out their daily activities, BCI alters the electrical activities of the brain. According to motor imagery (MI) classification [1], the cognitive activities that can be accessed through electroencephalogram (EEG) signals offer an intelligent solution for assisting people with special abilities to perform body movement solely through imagination without the assistance of any external support. It is most suitable for modeling BCI systems due to its non-invasive nature and wide exposure of EEG signals for various neurological activities [2,3,4,5,6].

An Efficient Missing Data Prediction Technique using Recursive Reliability

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Abstract

Collaborative filtering recommender system is utilized as a significant method to suggest products to the users depends on their preferences. It is quite complicate when the user preference and rating data is sparse. Missing value occurs when there are no stored values for the specified dataset. Typical missing data are in three categories such as (i) Missing completely at random, (ii) Missing at random and (iii) Missing not at random. The missing values in dataset affect accuracy and causes deprived prediction outcome. In order to alleviate this issue, data imputation method is exploited. Imputation is the process of reinstating the missing value with substitute to preserve the data in dataset. It involves multiple approaches to evaluate the missing value. In this paper, we reviewed the progression of various imputation techniques and its limitations. Further, we endeavored k-recursive reliability-based imputation (k-RRI) to resolve the boundaries faced in existing approaches. Experimental results evince the studied methodology appreciably improves the prediction accuracy of recommendation system.

Keywords:

Sparse Data, Missing Value, Recommendation system, Missing Value Imputation, Recursive Imputation, Prediction

Introduction

The problem of information overload has grown as a result of the rapid expansion of online products and services made available by Web-based technologies. Therefore, physically scanning and finding pertinent items and administrations for a client have become testing and tedious. Because they assist platforms in automatically locating the products that users are most likely to consume in accordance with their preferences, recommendation systems can help alleviate the problem of information overload. As a result, the recommendation systems have been put to good use in a variety of business applications, like movie recommendations on Netflix, book recommendations on Amazon, and music recommendations on Last.fm.

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.

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

Introduction

Particularly in the context of advertising and branding, visual attention is crucial in influencing customer behaviour and decision-making. Eye-tracking technology has become a potent tool for assessing visual attention, enabling researchers to look at how consumers interact with different stimuli, including brands, and their patterns of visual attention.

In this situation, a non-intrusive experiment can be created to look at eye tracking visual attention data on exposure to a brand. In this study, participants' eye movements are tracked as they watch a series of still photos or films that feature brand-related stimuli like packaging, logos, or ads.

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, as well as a brief discussion of the various fault types that can be found in HVAC systems and the use of data-driven fault detection in HVAC, AHU, and chiller systems.

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

Introduction

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.

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

In a range of applications, including environmental monitoring and industrial control, wireless sensor networks (WSNs) are used to collect and send data from a variety of sensors. Since sensors are frequently installed in outlying areas that are difficult to access and expensive to replace, energy efficiency is a crucial requirement for WSNs.This conference article offers a unique method for slicing-based protocols-based energy-efficient data aggregation in WSNs to address this issue. The method entails slicing the data into pieces and sending the pieces to the sink node via a hierarchical routing protocol. Each intermediary node aggregates the data slices, lowering the quantity of data transmitted over the network and consuming less energy.

Using Dynamic Blocking Expanding Ring Search Technique for Ad Hoc Networks to Reduce Delay

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Abstract

Energy and inactivity are the critical Nature of Administration boundaries of impromptu organizations. The ad hoc network's lower latency and lower energy consumption help to extend the network's lifespan. A route discovery process is used in reactive protocols to figure out the way to the destination, which causes more delays and uses more energy. Dynamic Blocking Expanded Ring Search (DBERS)—a novel method for route discovery—is proposed in this paper to reduce the amount of energy and time required for the process. DBERS shortens the amount of time and energy consumed by reactive protocol route discovery methods. Taking into account a variety of hop lengths, various network topologies are used to simulate DBERS' performance. The comparison of results demonstrates that DBERS significantly increases time efficiency and reduces energy use.

Keywords-AODV, BERS, ERS, BERS+, DBERS, MANET, latency, efficiency in energy use, route discovery

Introduction

Wireless networks that are self-organizing and independent of a fixed infrastructure are known as ad hoc networks. The development of effective routing protocols that can convey data between nodes rapidly and accurately is one of the main issues facing ad hoc networks. Due to network congestion and poor wireless connectivity, traditional routing protocols frequently experience excessive delay and low throughput.This conference paper offers a novel method for minimising delay in ad hoc networks utilising a dynamic blocking expanding ring search methodology to address this issue. The method entails segmenting the network into various zones and employing a dynamic blocking mechanism to stop data transmission across crowded nodes.

Particle Swarm Optimization is used in the design of a predictive PID

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Abstract

The proportional-integral-derivative (PID) controller is widely used in process control, motor drives, magnetic and optical memory, automotive, flight control, and instrumentation, among other industrial applications. PID tuning is the process of making PID parameters (Kp, Ki, and Kd) in order to get the system's best fitness value. Any system that relies on the PID to function in a stable mode must have the parameters of the PID determined. The particle swarm optimization (PSO) algorithm is used in this paper to design a predictive PID controller system for direct current (DC) motor applications. Using the Matlab simulation environment in Mathwork, extensive numerical simulations have been carried out. PSO parameters like inertia weight, iteration number, acceleration constant, and particle number need to be carefully adjusted and determined in order to reap the full benefits of the PSO algorithm.

Keywords-Particle swarm optimization (PSO), proportional-integral-derivative (PID) controller, optimization, and predictive PID

Introduction

To govern the behaviour of dynamic systems, proportional-integral-derivative (PID) controllers are frequently employed in control systems. But creating a PID controller that works well for a complicated system can be a difficult task that calls for knowledge and experience. Utilising model predictive control (MPC), which enhances the performance of the PID controller by taking into account the system's future behaviour, is one method of overcoming this challenge.In this conference work, a novel Particle Swarm Optimisation (PSO) design method for a predictive PID controller is presented. PSO is a metaheuristic optimisation method that draws inspiration from swarms of particle behaviour.

Begin Acceleration of the GPS Receiver in Space

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Abstract

A significant Doppler shift in a navigation signal brought on by satellite movement in Earth orbit complicates the cold start of the space GPS receiver, also known as the start without any information about the receiver's position, satellite constellation, or time. Compared to the standard GPS receiver, this increases the search space for the navigation signals by approximately five times.A method for accelerating the GPS receiver cold start time for pico- and femto-satellites is looked into in this paper.The parallel search in Doppler frequency and PRN codes and the serial search in code phase delay form the foundation of the proposed approach. While maintaining the simplicity of the FPGA signal processor and the low power consumption, it is able to reduce the cold start time of the GPS receiver operating in LEO orbit from approximately 300 to 60 seconds. In the piNAV GPS receiver, the developed algorithm was successfully implemented and tested. From 36 to 7.7 Joules, the amount of energy required to achieve the position fix was reduced by five times. This enhancement makes it possible to use such a receiver for position determination on femto- or pocket-sized satellites with lower energy budgets than the Cube Satellite.

Keywords-FPGA, low-Earth-orbit navigation, acquisition accelerator

Introduction

The Global Positioning System (GPS) is a popular navigation tool that offers precise positioning and timing data for a variety of uses, including military, nautical, and aviation. However, because of the harsh environment and weaker signal in space, conventional GPS receivers, which are made for use on the surface of the Earth, can perform significantly worse.This conference article offers a fresh method for boosting GPS receiver performance in space to address this issue. The strategy entails implementing cutting-edge algorithms for signal gathering, tracking, and navigation using an onboard signal processing unit. To endure the hostile space environment, the signal processing unit is made to be computationally effective, low-power, and radiation-hardened.The design and implementation of the signal processing unit, together with the methods employed for signal processing and navigation, are discussed in the paper.

Graphene Field-effect Transistor Behavioural Model

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Abstract

The behavioral model of a graphene field-effect transistor (GFET) is suggested in this abstract. In this approach, the GFET component is treated as a "black box" with just outside terminals accessible and disregarding the actual peculiarities straightforwardly. The introduced circuit model was developed to reflect consistent state qualities considering additionally GFET capacitances. The authors' model is defined by a relatively small number of unnested equations, all of which make it simple to extract the parameters. It was demonstrated that the proposed model can approximate the accuracy of the physical model when simulating steady-state characteristics. Future circuit or system-level simulations can be performed with the compact GFET model presented here.

Keywords — Graphene field-impact semiconductor, socialmodel,sensors

Introduction

Due to their special qualities like high electron mobility, low power consumption, and excellent frequency response, graphene field-effect transistors (GFETs) are a potential technology for high-performance electronics. However, modelling and simulation of GFETs are difficult due to their intricate physics.Thebehavioural model for GFETs presented in this conference article offers a precise and computationally effective method for simulating their behaviour. The model incorporates the fundamental electrical properties of GFETs, such as transconductance, drain current, and gate capacitance, and is based on the device's physics.Thebehavioural model's conception, implementation, and verification against experimental data are all described in the study.

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Mobile Robot Control Algorithm Testing Research Studio

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Abstract

Abstract—Unmanned Aerial Vehicles (UAVs) and mobile robot control and communication technologies have undergone significant development in recent years.In order to develop these technologies, it is necessary to have the appropriate software and hardware to enable the laboratory prototyping and simulation of control algorithms. The most recent solutions are showcased in the Laboratory of Intelligent Mobile Robots in this article. Four quadcopter drones (QDrone) and two-wheeled robots (QBot) with extensive sensor sets make up the laboratory equipment. Also included are a ground control station running Matlab-Simulink software, the OptiTRACK object tracking system, and the communication and security infrastructure. The results of measurements taken by robot sensors that were keeping an eye on various quantities while they were working are presented in this paper.The measurements included, among other things, the number of robots detected by the tested robots' IMU sensors (such as accelerometers, magnetometers, and gyroscopes).

Keywords-QDrone, UAV, mobile robots, MATLAB Simulink

Introduction

In a variety of fields, including industrial automation, logistics, healthcare, and service robotics, mobile robots are becoming more and more common. Control algorithms that direct the behaviour of mobile robots are essential for enabling these applications. These algorithms' creation and testing can be difficult tasks requiring access to specialised tools and knowledge.This problem is addressed with a specialised facility for the creation and assessment of control algorithms for mobile robots, which is known as a Mobile Robot Control Algorithm Testing Research Studio. A test bed for mobile robots, simulation software, and a variety of tools and resources are available in the studio to help researchers and engineers create and assess their algorithms.Researchers can test and improve their algorithms by using the studio, which is built to imitate numerous situations and scenarios.

Using Artificial Neural Networks for IoT Node Localization (ANN)

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Abstract

Abstract -Using artificial neural networks (ANNs) to calculate coordinates is one way to improve calculations related to locating a node in an IoT measurement system.The RSSI (Received Signal Strength Indicator) measurement serves as the foundation for the approach that is outlined in the article. The value of the RSSI is then processed by the neural network. As a result, the proposed method operates in two stages. RSSI coefficient samples are taken in the first stage, and then the node location is continuously determined. The neural network's learning process makes use of coordinate anchor nodes, which are sensors with fixed and previously known positions, as well as the RSSI coefficients matrix. The neural network's inputs are then fed the RSSI matrix for the system in which the nodes with unknown positions are located. The work produced a system and algorithm that enable object location determination without the need to process data separately in nodes with poor computational performance.

Keywords: WSN, Internet of Things, neural networks, node localization, and location errors

Introduction

Large-scale networks of interconnected devices may now be deployed thanks to the Internet of Things (IoT), which has a variety of applications, ranging from smart cities and homes to healthcare and industrial automation. However, precise space positioning of these devices is required for their effective communication and coordination. This endeavour is difficult since conventional localization techniques frequently rely on pricey and complicated hardware and are not appropriate for the resource-constrained IoT devices.In this regard, Artificial Neural Networks (ANN) have shown promise as a method for locating IoT nodes. A type of machine learning algorithms known as ANNs can recognise intricate patterns in data and generalise them to brand-new, unexplored data. Accurate and inexpensive localization algorithms that can be used on devices with limited resources can be created by training ANNs on sensor data gathered from IoT devices.In this conference article, a novel ANN-based method for IoT node localization is presented.

A new direct current circuit blocker that can regenerate current

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Abstract:

Due to improved controllability and equipment dependability brought about by the ongoing creation of power electronics, direct current (DC) power systems are growing in popularity. A key component of the system is a DC circuit breaker (DCCB) used for current disruption in a DC network. It is essential for separating networks both during fault clearing and typical load switching. Since the DC current lacks any naturally occurring zero crossing points like the AC current does, breaking it is a significant task. A further factor that opposes the instantaneous current breaking is the energy that is stored in the network inductances during regular operation. Therefore, during the current breaking procedure, all traditional DC circuit breaker topologies employ loss elements to dissipate this stored energy as heat. However, by creating a modified topology, this energy can be saved and then used again. The potential for energy recovery and reuse in DC circuit breakers has been examined in this paper, and a novel topology with regenerative current-breaking capability has been suggested. This novel topology can break the current and then send the network's stored energy back into the same network, increasing system efficiency overall.

Keywords: DC circuit breaker, fault current, protection, regeneration, and current breaking

Introduction

Direct current (DC) power systems are now much simpler to work with thanks to the astounding advancements in chip technology and the ongoing development of power electronics. With the fast expansion of renewable energy sources (RES) and the rising demand for intelligent and efficient loads, DC power distribution systems may end up being the best choice for many uses. Meanwhile, DC power systems are already in use in a number of application fields, including DC microgrid, HVDC transmission, electric vehicles, and electric traction load [1].

Controlling speed in DC and AC motors

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Abstract: In this research, three speed-control methods for DC and AC drives are presented: a state-space control by pole assignment with full state observer, an internal model control (IMC), and a proportional integral derivative (PID) control method. (ESSO). The three approaches are used in a case study to show their effectiveness. For the purpose of synthesizing the controllers, the drive models were obtained through experimental identifying. Along with effective disturbance rejection, the three strategies produced results that were acceptable in comparison to the demands placed on the system. The IMC strategy, on the other hand, emerged as a little softer and without a maximum overshoot, which in some circumstances and uses is typically a limitation.

Keywords: DC and AC drives, Motor control, Pole placement, State observer, State space

Introduction

The quality, effectiveness, and productivity of industrial services and procedures have all increased as a result of science and technology advancements. Various mechanisms used in modern industry necessitate speed control at various stages of the manufacturing process. A essential requirement for rotating electrical machines, primarily DC and AC motors, is that they must have these mechanisms. The DC motor has the ability to regulate speed, which can be done, for instance, by inserting resistors into the armature or by varying the voltage or current of the armature in the field. Despite their usage constraints, these motors have long held complete hegemony in the industrial sector [1]. On the one hand, the AC motor costs one-sixth as much as a DC motor of equivalent capacity and needs less upkeep.

Design and Simulation of a 5kW BLDC motor with half-buried permanent magnets using a stator body that already existed

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Abstract: This study suggests a design for a 5 kW, 100-volt brushless direct current (BLDC) motor that makes use of a stator that is already in place and is wired to a converter and outfitted with Hall sensors. The machine's outer edge is home to 54 slots on the stator, which is a radial flux motor type. In this instance, the design is concentrated on the rotor elements and turning arrangement. However, consideration is also given to inverter factors. It also takes into account some restrictions, such as the highest current and flux density, as well as the anticipated outputs, such as voltage, power, and speed. After extracting the magnetic flux distribution using a finite element magnetic simulation, analytical computations are carried out to determine the output values and characteristics.

 Keywords: BLDC motor, Cogging torque, Flux distribution, Half-buried magnets, Torque-speed characteristics

1. Introduction

The brushless DC (BLDC) permanent magnet motor has recently been used in a variety of applications, including industrial machinery, medical equipment, robotics, and the rapidly expanding market for electric cars (EVs) [1] through [4]. It is well known for its outstanding qualities, which include its straightforward construction, small size and weight, high efficiency, high torque density, good dynamic response, quiet operation, and straightforward upkeep [5]–[10]. The BLDC motor's characteristics as an actuator essentially combine the benefits of AC synchronous motors and DC brushed motors while also removing their major drawbacks. The brushed DC motor uses brushes and commutators, which create mechanical losses; the BLDC motor does not by converting the input DC-current into a frequency-controlled AC wave using an inverter.

A new artificial neural network in AC microgrid for power quality improvement

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Abstract:

Where the conventional grid is unable to supply, the microgrid idea provides a flexible power supply to the utility. The electricity network and distributed generators (DGs) are the foundations of the microgrid structure. Nonetheless, power quality (PQ) poses a significant challenge in the microgrid idea. The incorporation of renewable energy sources into conventional grids, in particular, increases issues with power quality, such as voltage sag/swell, oscillatory transient, voltage flickering, and voltage notching, which lowers the quality and reliability of the power supply. A microgrid is examined in this article, which includes PV cells as DG, a battery energy storage system (BESS), and a novel control strategy known as the nonlinear autoregressive exogenous model. (NARX).

Keywords: Artificial neural network, Battery energy storage system, Distributed generators, Microgrid Photovoltaic cell, Proportional integral controller

Introduction:

The conventional power production resources are limited by fossil fuels and other natural gas, oil, and so on, which have a significant environmental effect through pollution. As a result, the incorporation of renewable energy sources (RESs) was compelled into the conventional infrastructure. The incorporation of renewable energy sources (RESs) such as photovoltaic (PV), diesel generators, wind turbines (WTs), small hydropower plants, and fuel cells has greatly altered the microgrid framework and AC networks [1]. The incorporation of RESs has shifted the power grid's topological structure from condensed generation to dispersed production, particularly small-scale generation that is more available to load panels [2].

Design of a novel multilevel inverter structure based on a modified absolute sinusoidal PWM method

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Abstract: The advantage of multilevel inverters is that they produce high output voltage values with as little distortion as feasible. In this paper, a 15-level inverter is developed to reduce total harmonic distortion (THD) and obtain an output voltage with different step levels while using less power electronics switching devices. MATLAB/Simulink is used to design, model, and build a single-phase 11-switch inverter with zero-level (ZL) and none-zero-level (NZL) inverters based on the modified absolute sinusoidal pulse width modulation (MASPWM) method. According to the simulation findings, a multilevel inverter with NZL voltage has a lower distortion percentage than one with ZL voltage. THD of ZL inverter output voltage and current are 4% and 1%, respectively, while NZL is 3.6% and 0.84%. These findings demonstrate the efficacy of the proposed power circuit and MASPWM controller in achieving the required voltage with low THD.

Keywords: Less power switches, MASPWM, Multilevel inverter, Single phase, Zero-level and none-zero-level inverter

Introduction

Power inverters are used to transform direct current (DC) voltages to alternating current (AC). To ensure the safety of the equipment, the obtained AC voltages should have minimal distortion. The advantages of high-power multilevel inverter circuits outweigh those of conventional kinds. The output voltages generated at various step levels for the intended multilevel inverters should be as sine-wave as feasible with the least distortion. (THD). Previously, each H-bridge cell in the multilayer cascaded H-bridge inverter has the same single DC input voltage with four power switching devices as in the symmetrical cascade inverter. DC inputs and switch devices should be increased to boost AC voltage output levels.

The idea of smart grid applied to an industrial electrical system

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Abstract: Smart grids are an idea that combines electrical, automatic control, information, and networking technologies. This idea is a critical complement to the incorporation of renewable energy sources into electrical power systems. Although its primary utility is in transmission and distribution networks, it could also be used in industrial electrical systems. The purpose of this piece is to examine the benefits of implementing smart grid solutions in the industrial sector. Similarly, the outcomes of its implementation in a major industry in the Cuban province of Cienfuegos are presented. Controls for reactive compensation, voltage, and demand management were specifically integrated into a Supervision, Control, and Data Acquisition system to create a smart grid. It is demonstrated that in industries with adequate infrastructure and equipment, it is possible to effectively implement solutions with the functionalities and benefits inherent in smart grids.

Keywords: Demand management, Industrial electrical system, Power factor, SCADA, Smart Grid, Voltage control

Introduction

The depletion of fossil fuels and climate change are realities that are raising environmental awareness around the globe about how to reduce the sources of greenhouse gas emissions. Many nations have already established targets for low-CO2 energy production, as well as investments in efficiency and renewable energy sources. The business and public sectors want to lower the costs of their goods and services, while the residential sector wants to lower the amount of their energy bill. These realities necessitate a novel approach to managing energy resources [1], [2]. The implementation of various technologies included in the smart electric grids (SEG) concept in the electricity sector contributes to achieving these goals, because their implementation entails the use of advanced communication and control technologies and practices that improve reliability, efficiency, and security. Because each actor (i.e. institution, electricity company, technology manufacturer, or client) has a distinct view on the same reality based on their interests, the definition of SEG varies [3].

PV array and self-excited asynchronous generator in stationary independent generation systems

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Abstract: Examining and addressing the problem of producing green energy in remote places is crucial. Both the ecology and the economy are impacted by nonrenewable brid power. Priorities include efficient use of energy and reliable power. Eco-friendly and unaffected by the climate renewable energy. This method uses solar and wind energy, two environmentally friendly renewable energy sources that can also be used to share burden. Through the use of a DC-DC converter, solar energy will also maintain the stability of the system and the load voltage equilibrium. The asynchronous generator was chosen due to its long lifespan and minimal upkeep requirements, but when this machine is running, the voltage on the load side is out of balance. For use in wind turbines or small hydro generators, an asynchronous generator can be a practical substitute for well-developed synchronous generators due to their low cost, simplicity, low maintenance requirements, adequate resistance to wear and tear, and reduced overload damage.

Keywords: Asynchronous generator, DC-DC converter, Hybrid wind solar, MATLAB/Simulink Reliable electricity, Renewable energy

Introduction:

Energy is a crucial component of our existence. The increase in energy consumption has led to an imbalance between the production and use of energy. The imbalance is brought on by increased consumer use of energy and the rapid depletion of natural resources [1]. The use of fossil fuels has resulted in higher levels of global warming and pollution. Renewable energy sources have gained importance and popularity in order to satisfy energy demand while also preserving the environment. Renewable energy sources like wind, solar, and tidal power replenish the fuel-capable, plentiful, and clean form [2]. One of them is wind, a plentiful, ecologically friendly source of renewable energy. Asynchronous machines have many benefits for wind power plants, including affordability, durability, adaptability as an engine or generator, and self-protection against faults and overloads [3].

Enhancing power flow management in PV-battery grid networks by using the PSO algorithm

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Abstract: In this article, we've demonstrated how to create a control element based on a combination of fuzzy logic and an algorithm derived from PSO Animal Behavior to enhance the quality of the energy injected into the electrical network and the flexibility of its exchange between the various components of the proposed hybrid network (photovoltaic generator connected to the network-storage battery-load of the DC motor). The DC/AC and bi-directional DC/DC converters that serve as the foundation of the proposed hybrid network's power management are used in the suggested control. Software called MATLAB/Simulink is used to show how well the suggested management works. The findings demonstrate that the suggested control improved the quality of energy injected into the network, the response time during battery charging and discharging, and the stability of the photovoltaic energy produced, which increased the efficiency of the DC motor connected to the DC bus.

Keywords: Battery storage system, DC/DC bidirectional converter, Fuzzy logic, PSO, PV Solar

Introduction

One of the main factors driving the tendency towards renewable energies is the issues brought on by the use of fossil fuels, such as climate change, a lack of production, and rising prices. (solar and wind). According to [1], [2], improvements in technology, particularly in the area of power electronics, and the development of the PV industry over the past ten years have helped to give photovoltaic energy some degree of dependability. Additionally, the rapid development of PV applications, especially PV systems linked to the energy grid, which have grown in size from a few kW to over 100 MW, has been made possible by the development of intelligent regulation in the PV industry [3], [4]. In order to achieve this, the converters in the solar system must operate more effectively. A smart algorithm based on direct current and DC link voltage controllers for a three-phase grid-connected photovoltaic inverter is described in this study.

Improvement of grid-connected PV system's power quality

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Abstract: Due to its many advantages, solar photovoltaic (PV) power has maintained a dominant position in the area of producing electrical energy. A lymphoblastoid cell lines (LCL) filter is used to improve the electricity quality of the double-stage, triple-phase grid-connected solar PV (SPV) system. A DC-DC converter and a DC-AC converter enable a practical connection of the PV systems to the electrical interface in this way. A 3-phase DC-AC converter is used to convert boosted DC into AC and is provided to the grid. Instead of using an inverter, a 3-phase voltage converter is used to interface between the voltage produced by the PV system and the grid's AC transmission line. In this plan, a maximum power point tracking (MPPT) application is used to increase the PV array's effectiveness in the face of any erratic weather conditions. As a result, the solar PV array's maximum energy output could be guaranteed and interfaced with the grid. By using FFT analysis in MATLAB, the improvement in power quality achieved by using an LCL filter is measured.

Keywords: LCL filter, MPPT, Power quality, Renewable energy, Solar PV power

Introduction

Because of the high demand for green electrical energy and the decline of conventional power sources like natural gas, oil, coal, or nuclear, renewable forms of energy are more preferred in energy production. The most noteworthy source of energy production is solar PV, which produces less waste, pollution, and costs less to produce. Currently, there are no problems with solar PV energy production moving from the low to the high power grid system [1]. Transmission lines are used to manage accumulation and continuity, reduce supply power bank demands, and replace any traditional sources with non-traditional, green, renewable sources in order to meet the growing demand for energy and integrate multiple energy sources [2], [3].

Control of a permanent magnet synchronous motor using PI-back stepping and a harmonic reduction model

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Abstract:

The control of permanent magnet synchronous motors (PMSMs) using a non-linear adaptive PI-Back stepping design and a harmonics reduction model that employs an active shunt filter followed by a cascade band pass filter is the main topic of this article. Although traditional back stepping can guarantee the security of the system, it is frequently inaccurate. It generates a substantial amount of static error, which has a negative impact on the behaviour of the system and can lead to interruptions and loads that may occur in industrial settings. By integrating the PI controller with adaptive back stepping via robust Lyapunov functions, we can ensure minimal fixed errors and significant interaction with uncertainty. The efficacy of the suggested controller is verified.

Keywords: Back stepping, Control, Disturbances, Lyapunov Stability

Introduction

The synchronous motor, which can function as either a generator or a motor, is typically used in three-phase electricity systems. Permanent magnet synchronous motors typically operate and function in a similar manner to conventional synchronous motors. A rotating field is produced in the air gap when a three-phase voltage source powers the stator. This rotating field rotates at a steady rate of 'w/p' revolutions per second, where w is the frequency of the stator power source and p is the number of pole pairs [1]. Synchronous machines with permanent magnets are being used more and more in speed variation because of their low rotor losses, durability, and high specific power. These machines may be equipped with current inverters (based on thyristors) at exceptionally high power and energy levels, in contrast to how simple it is to connect the thyristors in series [2], [3].

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Performances of a doubly fed induction generator-based wind power system under the direction of a multi-level inverter

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Abstract: This research aims to determine how much more a multi-level inverter can contribute to a wind power production line (WPG) connected to a doubly supplied induction generator than a traditional two-level inverter. (DFIG). For optimal effectiveness, the DFIG runs in maximum power point tracking (MPPT) mode and is powered by a variable speed wind turbine. The stator of the DFIG is linked to the network, and the rotor is powered by a DC/AC inverter with five levels and an MPC structure that is controlled by PWM. By using conventional regulators and indirect vector control with oriented stator flux (IFOC), which guarantees a unitary power factor and zero reactive power, the network and the DFIG trade active and reactive power. The complete wind chain's current signals and voltages are examined for total harmonic distortion (THD), which is then criticised. The obtained findings are extremely encouraging and give wind turbines with multi-level inverters the chance to operate at high voltage and high power.

Keywords: Doubly fed induction generator, Indirect field-oriented control, multi-level inverter, Pulse width modulation, Total harmonic distortion

Introduction

A sizable and rapidly developing industry is wind electricity. Wind energy has experienced the world's fastest growth among all green energy sources over the past few decades. Due in large part to the energy crisis of 1974, it has experienced an unheard-of boom for the past 30 years [1]. As its primary source, the wind, is freely accessible everywhere in the world and emits no greenhouse gases, this energy is clean and non-polluting [2]–[6]. To take kinetic energy from the wind and transform it into electrical energy, the majority of wind turbines today are outfitted with a doubly fed induction generator (DFIG) in conjunction with a static AC/DC/AC converter [7].

A novel method of reliable speed sensor-less control for a photovoltaic solar panel-powered, doubly fed induction motor

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Abstract: In this work, we presented the modelling and simulation of the electrical operation of a photovoltaic (PV) system adapted by an MPPT control, the latter is applied to the robust observer for the control of the speed without sensor of a double fed induction motor (DFIM).Our machine is powered by the PV system, where the chosen control is the direct field oriented control with sliding mode speed regulator is used for the control of this machine which is powered by two pulse-width modulation (PWM) voltage inverters, finally the speed estimation of induction motor with observer based dual feed in sliding mode is presented. The simulation results show the efficiency of the proposed method.

Keywords: Double-fed induction motor, MPPT, Photovoltaic solar panel, Sensorless control, Sliding mode observer,
Vector control

Introduction

Renewable energies are environmentally friendly energies, among the advantages, they are not polluting, non-CO_2 waste, they fight against the greenhouse, and help create new jobs. Photovoltaic energy is the most significant energy in renewable energy which has been attracting growing interest in recent years. Today photovoltaic (PV) technologies are sufficiently mature and measured to take a real take-off in the field of power applications. The basic elements are cells that convert solar radiation into current electricity (photovoltaic effect) the creation and optimization of photovoltaic systems are the current problems, the resolution of these problems surely leads to a better use of solar energy [1]−[5]. The doubly fed induction motor (DFIM) is the most popular due to its high performance, energy quality [6]−[8]. However, this machine presents difficulties at the level of its control because this one presents a nonlinear system, strongly coupled, with fast dynamics and with parameters varying in time [9]−[11]. The flux-oriented vector control was developed to control the torque in transient conditions [12]−[15].

Mitigation of feed current harmonics in a 3-phase induction motor based on fuzzy logic

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Abstract: To improve the quality of electricity in the power grid with non-linear loads, a parallel active power filter is used. In many uses, the induction motor drive calls for improved performance. By reducing the delivery of current harmonics and associated warmth losses in an induction motor, the total performance is improved. In this article, a 3-phase induction motor's complete performance evaluation is discussed using a shunt active filter (SAF) based on fuzzy logic controllers, and the results are contrasted with proportional integral (PI) and proportional derivative (PID) controllers. The vertical speed indicator (VSI) fed induction motor in this work is supplied with a novel configuration of shunt active filters. A 3-induction-motor drive (IMD) using parallel SAF and a fuzzy logic controller (FLC) carried out the exercise. A simulation result from the MATLAB/Simulink software has been given to explain how the addition of an active filter close to the supply side reduces harmonics. To develop the induction motor dynamic response in this study, a fuzzy suitable judgment controller is utilized. Analysis of the simulation results, use of the MATLAB/Simulink software for the suggested FLC managed induction motor, and discussion of induction motor performance improvement.

Keywords: Fuzzy logic controller, Induction motor, Proportional integral, Proportional derivative controller, Shunt active filter, Total harmonic distortion

Introduction

Due to the many specifications related to price, size, portability, operational conditions, and high performance they provide to the tip users, induction motor drives are used for household, agricultural, and industrial applications. The contemporary power electronic converter has been used in conjunction with the high-performance AC drive system. By injecting harmonics into the power system, an induction motor (IM) drive system powered by a power electronic converter may cause extra electrical noises and disturbances. The failure of the electrical components and the development of these harmonics are the causes of power quality issues in power networks.

An asymmetric multilayer inverter based on SPWM with fewer switches: design and performance assessment

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Abstract: The advantage of multilevel inverters is that they can generate high output voltage values with little interference. In this paper, different step-level switching devices are used to provide an output voltage while reducing total harmonic distortion (THD). This research used level shift sinusoidal pulse-width modulation and phase shift sinusoidal pulse-width modulation techniques to build and simulate a 27-level inverter with three asymmetric H-Bridges. This model was developed and tested using MATLAB/Simulink under various conditions. As a result of the linearity between the voltage and current in the resistive load, the results showed that a multilevel inverter with PS-PWM produces less (THD) than a multilevel with LS-PWM when a resistive load is used. The produced voltage and current THD in (PS-PWM) and (LS-PWM) are 3.02% and 4.30%, respectively. When an inductive load is applied, however, the THD in the voltage is constant and has the same values as a resistive load in both the PS-PWM and LS-PWM techniques. THD in the current with an inductive load, however, dropped to 2.79% in (PS-PWM) and 4.04% in (LS-PWM). Lastly, these findings demonstrate that the suggested power circuit with PS-PWM performs better than (LS-PWM).

Keywords: Asymmetric DC sources, Cascade H Bridge, Multilevel inverter, Sinusoidal pulse width modulationTotal harmonic distortion

Introduction

Due to their numerous benefits, such as high-quality power, decreased switching loss, and the capacity to operate at a high level of voltage [1]-[5], multilevel inverters (MLI) have recently been used to compensate for static variables, active power filters, and motor driving applications. Flying-capacitor, diode-clamped, and cascaded inverter topologies are the three divisions of multilevel inverter topologies [6]-[8]. Because of its adaptability and simplicity, it has been used to manage the cascaded H-bridge (CHB) [9] through [13]. Symmetrical and asymmetrical topologies are the two different kinds of CHB inverters [14]-[18].

Harmonic distortion reduction in third rail electrical networks

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Abstract: The third rail system's extensive use of power electronic converters causes harmonic distortions in the rail electrical feeding systems to grow. Transformers and electrical equipment may overheat, leading to early gadget failure. In order to prevent harmonic distortions on electrical networks during real-time operation, which encompasses degraded operation as well as normal operation, it is crucial to address these distortions. In this study, electrical transient and analysis programme (ETAP) modelling software is used to examine the harmonic distortions of a third rail system. The studies take into account four working scenarios, including the typical operation and three degraded operations. When one of the bulk supply transformers or 33 kV feeders is out of commission, activities are compromised. The results of the research demonstrated that, as a result of the third rail system's use of 12-pulse rectifiers, the 11th and 13th order harmonics are the dominant harmonic orders. To reduce the individual voltage harmonic distortion (IHDv) and total voltage harmonic distortion (THDv), single-tuned harmonic filters are created and installed in 33 kV lines to ensure compliance with IEEE 519:2014.

Introduction

The rolling stocks in urban and suburban regions that frequently use DC third rail systems are powered by a 33 kV medium-voltage (MV) distribution network via rectifiers [4]–[6]. In third rail systems, the widespread use of rectifiers can lead to serious harmonic interference [7]–[9]. Numerous technological problems are caused by harmonic distortions, such as resonance [13, 14], degradation of transformers [10, 11] and electric motors [12], low power factor, broken protective relays, increased power losses, and interference with communication devices [15]. For instance, the third rail system's use of 12-pulse rectifiers has resulted in substantial harmonic pollution due to the generation of 11th and 13th order harmonics [16].

Improvement of the oscillation of the link power system to reduce the use of fossil fuels

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Abstract: In order to reduce carbon dioxide emissions, many international organizations have advocated for a decrease in the use of renewable energy. This paper examines the situation of electricity production based on fossil fuels. The best current answer is to switch from dirty, fossil fuel-based energy to clean, renewable energy. Large-scale regions are connected by electrical interconnections, but oscillations are one of these oscillations' main problems. Depending on the necessary electrical load, power facilities' use of fossil fuels varies. It is impossible to decrease the energy needed to meet the necessary electrical load under these circumstances. The improvement of inter-area oscillation using phasor measurement unit technology for real-time monitoring and measurement accuracy is the suggested answer in this article. We put the suggested fix for the North African power infrastructure to the test. The findings highlight the significance of strengthening communication networks to cut back on the use of fossil fuels.

Keywords: Fossil energy, Inter-area, Oscillation, Phasor measurement unit, Power system

Introduction

The need for more electronic energy is still growing over time. In order to guarantee supply and satisfy consumer demand for electric energy usage, electric energy producers primarily rely on fossil fuels. The release of carbon dioxide (CO_2) emissions, which is bad for the environment, is a significant drawback of fossil fuels. Transportation, manufacturing, and consumption of fossil fuels account for about two thirds of carbon dioxide emissions [1]. On average, the world's electricity generation industry now emits close to 530 g of CO_2 per kilowatt-hour [2]. Research is ongoing in the field of reducing carbon dioxide emissions due to energy use. The use of fossil fuels contributes to environmental issues like air pollution and global warming, which have a negative impact on human health [3].

Single-inductor single input, three output DC–DC power converter with novel topology

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Abstract: In this paper, a single inductor boost converter-derived single input triple output (SITO) DC-DC power converter circuit is suggested. Many electronic circuit applications require numerous DC output voltages, just like multi-level inverters. The expense, size, and weight of the system are all increased by using various power supply circuits. A single controller is used to integrate numerous sources and outputs into the multiple-input, multiple-output power conversion system. Its simple design, cheap price, and small size make it appropriate for various power conversions, including those involving renewable sources. The single-inductor single-input triple-output (SI-SITO) DC-DC power converter that is being suggested in this series is built to generate three independent DC output voltages and two dependent output voltages. The suggested circuit is modeled after a typical boost converter with a solitary inductor. The benefit of the suggested circuit is its use of basic control techniques and few components. Utilizing Mat Lab simulation, the design and performance study is carried out. The advantages of the suggested circuit are evident from the experimental findings.

Keywords: Boost converter, Buck converter, multi-level inverter, PV, SI-SITO

Introduction

Numerous industrial uses require output of regulated DC power. Power conversion and management are required to use this regulated DC output. The type of power source that is available-AC or DC-determines whether a two-stage or single-stage power conversion is used. The standard buck [1], [2], boost [3], and buck-boost [4] converter topologies are used to convert DC to DC. There are only a few industrial uses [5]-[12] that need more than one regulated DC output voltage, including photovoltaic, electric vehicles, and data centers. The multiple independent sing-input single-output (SISO) converter topologies utilizing traditional DC-DC converters are used to meet the multiple regulated DC voltage needs.

An overview of switched reluctance synchronous motor type machine modelling techniques and structural topology

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Abstract:

Induction motors (IM) and permanent magnet synchronous motors have been replaced with switched reluctance synchronous motors (SRSM). (PMSM). Due to its sturdy and uncomplicated structure, which results in low maintenance, production, and running costs, the SRSM is a workable solution for electric motors. Low mean torque, low torque density, and too many torque fluctuations are just a few of the SRSM's shortcomings. By taking the structure topology and driving system into account, the SRSM efficiency can be increased. This paper examined the SRSM's structural topology-based performance characteristics. The segmented structure topologies of the SRSM were compared with the traditional structures in a number of literature works. Both numerical and analytical techniques can be used to estimate the SRSM's performance. Numerous numerical techniques, including FEA and BEM, are employed to maximize the efficiency of electrical motors. The major disadvantage of the numerical method is that it is very difficult to implement the control algorithm with FEA software. This is despite the fact that it can provide an accurate estimate of motor performance. However, whether or not high-dimensional system matrices are solved, the analytical method, particularly the MEC method, is faster in assessing motor performance and greatly lowers computational complexity.

Keywords: Analytical analysis, Electromagnetic analysis, Magnetic equivalent circuit, Mathematical modelling, Numerical analysis, Segmented structure, Switched reluctance motor.

1. Introduction

The use of electric motors in domestic and industrial uses has been the subject of numerous in-depth studies in recent years. There are many choices available for both household application systems and industrial electric motors. The first candidate is an induction motor (IM), which has poor power performance but is equivalent to the rotation type of an electric motor [1], [2]. The permanent magnet synchronous motor (PMSM) is the second choice [3], [4]. Although the PMSM is an electric motor with high performance, its primary flaw is the cogging torque, which has an impact on position tracking and control [5]. The switched reluctance synchronous motor (SRSM) is the finest option for industrial uses and a viable choice for electric motor drives. The SRSM's robust and simple design, which consists of a stator or mover with concentric windings,

makes it straightforward to maintain and has low manufacturing and capital expenses [5] to [[9]. Additionally, the cost efficiency of synchronous motors (SM) may be enhanced by the absence of a PM from the SRSM [10]. Due to these characteristics, there has been significant progress in spreading the word that SRSM can be used to replace the DC and PM motors. To make these motors more competitive with AC (asynchronous and synchronous) motors, a number of tests and simulations have also been carried out and documented in the literature [11], [12].

Low mean torque, low torque density, and too many torque ripples are just a few of the SRSM's faults. Mechanical wear, vibration, and acoustic disturbance are all results of torque ripples [8]. The thrust ripple can be decreased or eliminated by changing the shape or using the right management strategy, which will enhance the performance of the SRSM [12]–[14]. In predicting and assessing the EM performances of the SRSMs, the literature study contrasts the segmented SRSM (SSRSM) with the conventional SRSM (CSRSM) structure topology. Section 3 studies and explains in depth how improving torque and torque ripple, which causes acoustic noise and vibration, can be accomplished by altering the topological structure of the SRSM. In this review, the control method is not discussed.