

N. R. Shetty • L. M. Patnaik • N. H. Prasad • N. Nalini *Editors*

Emerging Research in Computing, Information, Communication and Applications

ERCICA 2018

This proceedings volume covers the proceedings of ERCICA 2018. ERCICA provides an interdisciplinary forum for researchers, professional engineers and scientists, educators, and technologists to discuss, debate and promote research and technology in the upcoming areas of Computing, Information, Communication and their Applications. The contents of this book cover emerging research areas in the fields of Computing, Information, Communication and Applications. This will prove useful to both researchers and practicing engineers.



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Preface

The Fifth International Conference on “Emerging Research in Computing, Information, Communication and Applications,” ERCICA 2018 is an annual event organized at the Nitte Meenakshi Institute of Technology (NMIT), Yelahanka, Bangalore, India.

ERCICA aims to provide an interdisciplinary forum for discussion among Researchers, Engineers and Scientists to promote research and exchange of knowledge in Computing, Information, Communications and related Applications. This conference will provide a platform for networking of Academicians, Engineers and Scientists and also will enthuse the participants to undertake high end research in the above thrust areas.

ERCICA-18 received more than 400 papers from all over the world viz. from China, UK, Africa, Saudi Arabia and India. The ERCICA Technical Review Committee has followed all necessary steps to screen more than 400 papers by going through six rounds of quality checks on each paper before selection for Presentation/ Publication in Springer proceedings.

The acceptance ratio is only 1:3

July 2018

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ERCICA-2018

The Fifth International Conference on “Emerging Research in Computing, Information, Communication and Applications”, (ERCICA-2018) was held during July 27-28, 2018 at Nitte Meenakshi Institute of Technology (NMIT), Bangalore and organized by the Departments of CSE and MCA, NMIT.

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ERCICA 2018

The Fifth International Conference on “Emerging Research in Computing, Information, Communication and Applications,” ERCICA-2018 is an annual event jointly organized by the Departments of CSE and MCA during July 27-28, 2018 at Nitte Meenakshi Institute of Technology (NMIT), Yelahanka, Bangalore, India.

ERCICA-2018 is organized under the patronage of Prof. N R Shetty, Advisor, Nitte Education Trust. Dr. L. M. Patnaik, Technical Advisor, NMIT, Dr. H. C. Nagaraj, Principal served as the Conference Chair and the Program Chairs of the conference were Dr. N. H. Prasad, Professor and Head, MCA and Dr. Nalini N., Professor, CSE, NMIT, Bangalore, Karnataka.

ERCICA aims to provide an interdisciplinary forum for discussion among Researchers, Engineers and Scientists to promote research and exchange of knowledge in Computing, Information, Communications and related Applications. This conference will provide a platform for networking of Academicians, Engineers and Scientists and also will enthuse the participants to undertake high end research in the above thrust areas.

For ERCICA 2019, authors are invited to submit the manuscripts of their original and unpublished research contributions to ercica.chair@gmail.com (ERCICA website: <http://nmit.ac.in/ercica/ercica.html>). All the submitted papers will go through a peer review process and the corresponding authors will be notified about the outcome of the review process. There will be six rounds of quality checks on each paper before selection for Presentation/Publication. Authors of the selected papers may present their papers during the conference.

Acknowledgments

First of all, we would like to thank Professor N. R. Shetty who has always been the guiding force behind this event's success. It was his dream that we have striven to make a reality. Our thanks to Professor L. M. Patnaik, who has monitored the whole activity of the conference from the beginning till its successful end.

Our special thanks to Springer and especially the editorial staff who were patient, meticulous, and friendly with their constructive criticism on the quality of papers and outright rejection at times without compromising the quality of the papers as they are always known for publishing the best International papers.

We would like to express our gratitude to all the review committee members of all the themes of Computing, Information, Communication and Applications and the best paper award review committee members.

Finally, we would like to express our heartfelt gratitude and warmest thanks to the ERCICA 2018 organizing committee members for their hard work and outstanding efforts. We know how much time and energy this assignment demanded, and we deeply appreciate all the efforts to make it a grand success.

Our special thanks to all the authors who have contributed to publish their research work in this conference and participated to make this conference a grand success. Thanks to everyone who have directly or indirectly contributed to the success of this conference ERCICA 2018.

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A COMPUTATIONAL SEGMENTATION TOOL FOR PROCESSING PATIENT BRAIN MRI IMAGE DATA TO AUTOMATICALLY EXTRACT GRAY AND WHITE MATTER REGIONS

Ayush Goyal^a, Sunayana Tirumalasetty^a, Disha Bathla^b, Manish K. Arya^c, Rajeev Agrawal^c, Priya Ranjan^b, Gahangir Hossain^a, Rajab Challoo^a

Abstract

Brain MRI imaging is necessary to screen and detect diseases in the brain, and this requires processing, extracting, and analyzing a patient's MRI medical image data. Neurologists and neurological clinicians, technicians, and researchers would be greatly facilitated and benefited by a graphical user interface based computational tool that could perform all the required medical MRI image processing functions automatically, thus minimizing the cost, effort and time required in screening disease from the patient's MRI medical image data. Thus, there is a need for automatic medical image processing software platforms and for developing tools with applications in the medical field to assist neurologists, scientists, doctors and academicians to analyze medical image data automatically to obtain patient-specific clinical parameters and information. This research develops an automatic brain MRI segmentation computational tool with a wide range of neurological applications to detect brain patients' disease by analyzing the special clinical parameters extracted from the images and to provide patient-specific medical care, which can be especially helpful at early stages of the disease. The automatic brain MRI segmentation is performed based on modified pixel classification technique called fuzzy c-means followed by connected component labelling.

Keywords: segmentation, medical imaging, fuzzy c-means, neurological application.

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DEVELOPING ONTOLOGY FOR SMART IRRIGATION OF VINEYARDS

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Abstract

As availability of ground water is getting reduced these years, proper scheduling of irrigation is very important for survival and improvement of vineyards in southern part of India. Well calculated irrigation scheduling also improves quality of grapes. The knowledge about irrigation to vineyards is available in various documents and it is scattered. This knowledge can be made available to grape growers through computer based applications. As Semantic Web is playing important role, information sharing among varying automated systems, extraction of information from such documents and representing it as ontology is a good idea. This paper presents techniques for automated extraction of knowledge from text resources using natural language processing technique for building vineyard ontology. Smart irrigation system can be developed using IoT sensors and other ICT devices. The paper explains ontology built for resources used under smart irrigation system. It suggests on how smart irrigation systems can be built by grape growers by utilizing vineyard ontology and smart irrigation ontology.

Keywords: Ontology building • Irrigation scheduling • Grapes • Knowledge-base • Natural language processing;

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AN INTENSIVE REVIEW OF DATA REPLICATION ALGORITHMS FOR CLOUD SYSTEMS

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Abstract

Cloud computing is a technological paradigm that facilitates a universal platform for hosting and accessing services and data by means of a large number of shared resources by an equally large number of users across the globe. Since a large amount of data is involved it becomes crucial to make the data available to the users on the go without compromising with the integrity of data. Data replication is used to make copies of the data and files such that they can be accessed without delay and also act as a backup in case of any failure. Here we have discussed crucial data replication algorithms namely, Adaptive data replication strategy (ADRS), High QoS-first replication (HQFR), Build time algorithm, Cost-effective Incremental Replication strategy (CIR) and Dynamic Replica Control Strategy (DRCS).

Keywords: Quality of Service, Hadoop File System (HDFS), Replication Factor

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INTEGRATED CRYPTOGRAPHY FOR INTERNET OF THINGS USING TBF APPROACH

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Abstract

In current trends internet based portable system are on the huge demand and in coming future it will be the most demanded technology among the smart society. It is very difficult to say that entire world will use the smart technology but majority of the developed and developing countries will base on smart work, using smart technology. The people can control their smart devices from remote location and can be causation free with security issues which is associated with their valuables and other belongings. But all these are not so easy to implement practically to solve security pitfall and other issues to maintain reliable usage of smart devices. Here, in our proposed system we are providing data security on data layer by using the concept of excessive cryptography and implementing the integrated approach of two cryptography techniques i.e; TBF-Transposition and Blowfish cryptography techniques which can make powerful security barrier against the vulnerability and can stop the illegal usage of data. Here first of all the plain text will go through transposition after that blowfish block cipher technique will be applied on consequential value from transposition outcome. This application will use in highly sensitive security purpose over the smart secure communication as we know that security issues is a major challenges among smart devices where the data is more sensitive and if it will go wrong hands there will be lose of human life in some cases. Finally our work will contribute to integrate the crypto techniques for maintaining more security without breach of services.

Keywords: Cryptography, IOT security, Transposition, Blowfish, Security Services, Block Cipher.

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DATA GOVERNANCE ON LOCAL STORAGE IN OFFSITE

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Abstract

High dimensional data concerns large-volume, complex, growing data sets with multiple, autonomous sources. As the Data is increasing drastically day-to-day, it is a major issue to manage and organize the data very efficiently. This emerged the necessity of machine learning techniques. With the Fast development of Networking, data storage and the data collection capacity, Machine learning cluster algorithms are now rapidly expanding in all science and engineering domains such as Pattern recognition, data mining, bioinformatics, and recommendation systems. So as to support the scalable machine learning framework with Map Reduce and Hadoop support, we are using Apache Mahout to manage the High Voluminous data. Various Cluster problems such as Cluster Tendency, Partitioning, Cluster Validity, and Cluster Performance can be easily overcome by Mahout clustering algorithms. Mahout manages data in four steps i.e., fetching data, text mining, clustering, classification and collaborative filtering. In the proposed approach, various data types such as Numeric, Characters and Image datasets are classified in the several categories i.e., Collaborative Filtering, Clustering, Classification or Frequent Item set Mining. Some of the Pre-clustering techniques are also implemented such as EDBE, ECCE, and Extended Co-VAT. A non-Hadoop Cluster named Taste recommendation Frame work is also implemented.

Keywords: Data Security, Local storage restriction, Group policy Object, Thin Client, VDI, Data Protection

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EXTRACTION OF CHARACTER PERSONAS FROM NOVELS USING DEPENDENCY TREES AND POS TAGS

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Abstract

Novels are a rich source of data for extracting interesting information. Besides the plot, the characters of a novel are its most important elements, that shape the story and its message. An interesting task to consider is extracting these characters from novels in the form of the personas they embody. In this paper, we define and introduce a method to extract such personas of characters in fiction novels, in the form of descriptive phrases. These personas are divided into three types of description – facts, states, and feelings. We show that such a model performs satisfactorily returning an extraction precision of 91% and average classification accuracy of 80%. The algorithm uses Universal Dependency Trees, POS tags, and Word-Net to capture semantically meaningful descriptions of characters portrayed. The results have the potential to serve as input for future NLP tasks on literature fiction like character clustering and classification using techniques such as sentence embeddings.

Keywords: Universal Dependency Trees, Part-Of-Speech Tags, WordNet, Natural Language Processing.

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A MULTIFACTOR AUTHENTICATION MODEL TO MITIGATE THE PHISHING ATTACK OF E-SERVICE SYSTEMS FROM BANGLADESH PERSPECTIVE

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Abstract

A new multifactor authentication model has been proposed for Bangladesh taking cost effectiveness in primary concern. We considered two factor authentications in our previous e-service models which were proven to be insufficient in terms of phishing attack. Users often fail to identify phishing site and provide confidential information unintentionally, resulting in a successful phishing attempt. As a result, phishing can be considered as one the most serious issue and required to be addressed and mitigated. Three factors were included to form multifactor authentication namely user ID, secured image with caption and one time password. Through the survey, the proposed multifactor model is proven to be better by 59% points for total users which comprises 55% points for technical users and 64% points for non-technical users in comparison to traditional two factors authentication model. Since the results and recommendations from the user were reflected in the model, user satisfaction was achieved.

Keywords: Phishing Attack, E-Banking, E-Service, online banking.

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STUDY ON ENERGY EFFICIENT AND LIFETIME ENHANCED CLUSTERING ALGORITHM BASED ROUTING PROTOCOLS IN WIRELESS SENSOR NETWORK

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Abstract

The sensor nodes in wireless sensor network (WSN) comes with limited battery life thus energy usage in WSN is to be handled with great care. The routing protocols are the major research area to work on the QoS of the network such as network life time, scalability, energy consumption, packet overhead etc. Since sensor node posses limited battery life, to use nodes efficiently yet not loosing connectivity in the network becomes a major issue in designing the routing protocols. To achieve energy efficiency and better network lifetime grouping of sensor nodes into small clusters and selecting one cluster head seems to have more advantages in comparison to other network models to get better scalability, robustness and end to end data delivery. In this paper we have discussed and studied the different energy efficient routing protocols for clustering of sensor nodes in wireless sensor network, its merits, demerits and applications.

Keywords: WSN, energy efficient routing protocols, clustering algorithms.

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ROLE OF FOG COMPUTING IN IOT-BASED APPLICATIONS

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Abstract

Internet of Things (IoT) as the name suggests is an interconnection of our daily usage items like smartphones, cars, laptops, tube lights, electric fans, etc. With the inception of IoT, each and every electronic item in this world would have an IP address. It would transform our way of interaction, making our life more autonomous. The essential requirement for the upcoming of this technology includes real-time response, low latency, fast processing and computation capabilities. These features being difficult to be handled by Cloud Data Centres because of their remote location, leads to development of a new technology called Fog Computing, which is an extension of Cloud Computing services from cloud data centres towards the edge devices. Fog Computing possess some security and privacy threats which are discussed in this paper. There is a need to resolve these threats so that people use Fog-based IoT applications without any reluctance. Some of the solutions proposed are also mentioned in this paper.

Keywords: IoT; Fog Computing; Cloud Computing; applications; challenges

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SINGLE HORIZONTAL CAMERA BASED OBJECT TRACKING QUADCOPTER USING STAGAUS ALGORITHM

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Abstract

This research is a solution to the problem of a hardware platform of object tracking drones. This platform can be used to build further advancements such as selfie-drones, follow-me drones for adventure sports and robot pets. StaGaus algorithm has been derived using first principles and is compared against standard algorithms like SRDCF. The algorithm is tested on, an on-board two Android phones for real-time telemetry. This paper demonstrate that StaGaus works even on memory and performance constrained devices. In order to standardise the development of object tracking drones' algorithms, we have built a customised ROS based Gazebo simulator from scratch. This simulator is capable of simulating multiple robots of multiple types. This uses actual physics Open Dynamics Engine which has been compared against the existing simulators. Finally, as a by-product, this design proved that the cost of the proposed physical quad-copter is low.

Keywords: Drone, Image Processing, Android, Machine Learning, Simulator using ROS and Gazebo.

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IOT ENABLED MEDICINE BOTTLE

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Abstract

Internet of Things(IoT) has facilitated a reassuring opportunity to develop powerful and dynamic industrial systems and applications by making use of universality of sensors, actuators and network connectivity. IoT can immensely benefit people when used in the medical field. Non-adherence to a medical routine is a major problem faced by patients. According to the World Health Organization, increasing the effectiveness of adherence interventions may have a far greater impact on the health of the population than any improvement in specific medical treatments. In an attempt to address this problem, in this paper, a special system that monitors and tracks the consumption of medicine of any patient is presented. Adherence needs are met through the implementation of a mobile application. The result of this will be timely consumption of the medicine by the patients.

Keywords: Internet of Things(IoT), NodeMCU, Infrared Sensor, Ultrasonic Sensor, Firebase Cloud.

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REVAMP PERCEPTION OF BITCOIN USING COGNIZANT MERKLE

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Abstract

The bitcoin network adopt the regulation of peer-to-peer network for storing and retrieving data. Data synchronization and consistent verification is important in peer-to-peer networks for proving truth of data. Proof of existence of data is important for many applications and it can be verified by means of searching process. The goal of this paper is to minimize the time of verifying the transaction residence in the shared ledger of bitcoin network. In global ledger management like blockchain, the bitcoin transaction verification and validation is fundamental which is mainly used by miners for providing the proof-of-work for the transactions to achieve block reward and providing trust among the peers. In this paper we have provided a new way of verifying the transaction existence in blockchain by means of altering the data structure of Bitcoin Merkle into a new form of Cognizant Merkle which modifies the structure of existing bitcoin system into a new form which uses less memory and achieve more speed compared to Bitcoin.

Keywords: Bitcoin, Mining, Bitcoin Merkle, Cognizant Merkle, Proof-Of-Work.

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A NOVEL ALGORITHM FOR DNA SEQUENCE COMPRESSION

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Abstract

Deoxyribonucleic Acid (DNA) sequences vary in terms of their size and fall within the range of billions of nucleotides. The value increases to twice or thrice its original value annually. Techniques of data compression and related methods that originate from the information theory are frequently understood as relevant for the field of data communication, exploration, and storage. In the present situation, it is vital to store data for biological sequences. The CompressBest algorithm proposed in the paper for the compression of DNA sequences helps attain a better compression ratio and is much faster when compared to the existing compression techniques. CompressBest algorithm is applicable to compression of DNA sequences with a reduction in storage space. The proposed algorithm is tested over the data from the UCI repository.

Keywords: DNA sequences, data compression, deoxyribonucleic acid, dynamic programming.

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DIGIPEN: AN INTELLIGENT PEN USING ACCELEROMETER FOR CHARACTER RECOGNITION

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Abstract

The idea is to identify the character being written by a user on a piece of paper by observing the acceleration of the pen while writing these characters and passing this acceleration data to an Artificial Intelligence(AI) algorithm. Using an off-the-shelf accelerometer paired with a microcontroller using Inter-Integrated Circuit(i2c) protocol, we get sequential acceleration values in three directions. Upon observing this with this data, we noticed the same patterns when writing a specific character and decided to use efficient Long Short-Term Memory(LSTM) cells to recognize the patterns. After collecting some data for training the neural network and doing some pre-processing of the data, we used Basic LSTM cells in the models to recognize the patterns from the sequences of these values. LSTM cells were preferred over regular Recurrent Neural Network cells(RNN) due to LSTMs ability to remember longer sequences. Multiple LSTM models with a different number of layers and sizes with different activation functions and dropout values were trained and tested for performance and we were able to achieve a test accuracy of 47% on a fairly small dataset which far exceeds the 10% accuracy benchmark which would have been simple guesswork. With some more optimization of the hyperparameters of the neural network and training with a larger dataset, we believe better performance can be achieved. For the purpose of this paper, we have used numerical digits(0-9) as the characters to be classified.

Keywords: Smart Pen · Artificial Intelligence · LSTM · IoT · Cloud · Supervised Learning

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DESIGN OF FPGA BASED RADAR AND BEAM CONTROLLER

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Abstract

Radar controller is vital component in a Radar system. It enables transmission of RF energy, generation of complex waveform schemes and precision timing to gate the receiver. The paper presents architecture for FPGA based Radar controller. It includes beam controller to schedule dwell requests among all tasks. Proposed design is robust, flexible and uses VHDL based modules to promote reuse and cost optimization. The paper depicts detailed hardware and software methodology adopted during the development.

Keywords: FPGA, Controller, Phase Gradient.

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EFFECT OF LATTICE TOPOLOGIES AND DISTANCE MEASUREMENTS IN SELF ORGANIZING MAP FOR BETTER CLASSIFICATION

Sathiapriya Ramiah

Abstract

Self Organizing Map (SOM) is a widely used algorithm in artificial neural network for classification. Despite the general success of this algorithm, there are several limitations which some of them are poor classification accuracy and slow rates of convergence when the standard lattice topology and distance measurement are implemented. This paper investigates the performance of SOM using different topologies and different distance measurements. The results obtained showed that SOM with hexagonal topology and Euclidean distance measurement outperforms other topologies and distance measurement using at any scale datasets.

Keywords: Self Organizing Map, Best Matching Unit, Topology, Distance Measurement, Accuracy.

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EVALUATION AND CLASSIFICATION OF ROAD ACCIDENTS USING MACHINE LEARNING TECHNIQUES

Jaspreet Singh^a, Dr. Gurvinder Singh^b, Prithvipal Singh^c, Mandeep Kaur^d

Abstract

The root cause of traffic accidents is hard to determine these days due to complex combination of characteristics like mental state of driver, road conditions, weather conditions, traffic, and violations of traffic rules to name a few. The deployment of machine learning classifiers has replaced traditional data mining techniques like association rule mining. Application of machine learning techniques in the field of road accidents is gaining popularity these days. This paper utilized four machine learning techniques viz. Naïve Bayes, k-Nearest Neighbours, Decision trees, and Support Vector Machines for evaluation of Punjab road accidents. This work had a challenge of performing parametric evaluation to extract highly relevant parameters especially for Punjab. The outcome of this study yields 12 most suitable parameters and maximum performance of 86.25% for Decision Tree classifier.

Keywords: Road Accidents, Machine Learning, Parametric Evaluation, Punjab Road Safety.

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MULTI-LANGUAGE HANDWRITTEN RECOGNITION IN DWT ACCURACY ANALYSIS

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Abstract

Discovery of gender orientation from penmanship of an individual shows an intriguing exploration issue with applications in measurable record test, essayist recognizable proof and mental investigations. This paper displays a compelling strategy to anticipate the gender orientation of a person from disconnected pictures of penmanship. The proposed strategy depends on a worldwide approach that thinks about composing pictures as surfaces. Each written by hand picture is changed over into a finished picture which is disintegrated into a progression of wavelet sub-groups at various levels. The wavelet sub bands are then stretched out into information successions. Every datum succession is quantized to create a Discrete Wavelets Transform (DWT) that produces extraction. These highlights are utilized to prepare two classifiers, numerous occurrence learning and Multiclass bolster vector machine to separate amongst male and female handwriting recognition compositions. The execution of the proposed framework was assessed on two databases, HWSC and TST1, inside various testing exploratory situations and acknowledged arrangement rates of up to 94.07%.

Keywords: Disconnected penmanship examination, gender location, surface investigation, wavelet sub-band, emblematic progression.

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A NOVEL $H-\infty$ FILTER BASED INDICATOR FOR HEALTH MONITORING OF COMPONENTS IN A SMART GRID

Ranjini Warriar.E^a, P V Sunil Nag^b, C.Santhosh Kumar^c

Abstract

Health monitoring of a smart grid is very important to ensure reliability of the grid. This can be achieved by developing various indicators for the components of the grid. These indicators are very powerful if they are model based as they can be used in real time without need for extra hardware provided the model of the systems and the model parameter values are available. This work presents a novel $H\infty$ filter based fault indicator. The fault chosen here is the stator interturn fault of a wound rotor synchronous generator. It will be proved that 1) the indicator sensitive to fault and is insensitive to other kinds of spurious effects like load imbalance. 2) The indicator can be used to find the magnitude of fault. 3) The indicator can function irrespective of the type of uncertainties assumed in modelling the system. As far as the knowledge of the author goes this is the first time $H-\infty$ filter based indicators are used for stator interturn fault of a wound rotor synchronous generator.

Keywords: $H-\infty$ filter, fault indicators, model based, wound rotor synchronous generators, smart grid

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A SURVEY ON INTELLIGENT TRANSPORTATION SYSTEM USING INTERNET OF THINGS

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Abstract

An Intelligent Transportation System (ITS) can reduce traffic congestion on roads through reduced use of private vehicles. For the same, we need to expand existing infrastructure for the identified region, but considerable time and resources are required to set up state-of-the-art infrastructure from scratch. However, technologies like Internet of Things (IoT) can be used with the existing infrastructure for the design of an efficient public transportation system. This paper surveys a set of solutions available in the literature to design of an ITS system using IoT along with challenges and future scope for the improvement of the existing solutions.

Key words: Internet of Things (IoT), Intelligent Transport System (ITS), Survey

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CRUST: A C/C++ TO RUST TRANSPILER USING A “NANO-PARSER METHODOLOGY” TO AVOID C/C++ SAFETY ISSUES IN LEGACY CODE

Nishanth Shetty^a, Nikhil Saldanha^a, Thippeswamy MN^b

Abstract

CRUST a language translator (transpiler) has been developed which converts programs “C / C++” HLLs to programs in “RUST” HLL. RUST created by Mozilla has become popular as a systems programming language as it provides constructs and tool support for developing safe and secure programs without hassles. Safe RUST ensures that the programs developed using these programming constructs are safe and secure by enforcing compiler restrictions, concurrency without data races, memory safety without garbage collection and abstractions with low overheads. CRUST is a semi-automated transpiler, to automatically convert a subset of “C/ C++ code base into Rust without much effort. This is done using a unique Nano-Parser Methodology. CRUST also enhances the readability and understandability of the program by adding extensive documentation into the translated code. It yields a code which is guaranteed to be thread-safe and proven to be faster.

Keywords: C++, memory-safety, Nano-Parser Methodology, Rust, transpiler, type-safety.

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SPECIES ENVIRONMENTAL NICHE DISTRIBUTION MODELLING FOR PANTHERA TIGRIS TIGRIS ‘ROYAL BENGAL TIGER’ USING MACHINE LEARNING

Shaurya Bajaj^a, Geraldine Bessie Amali D^b

Abstract

Biodiversity loss due to habitat degradation, exploitation of natural deposits, rapid change of environment and climate and various anthropogenic phenomenon throughout the last few decades in the quest of development has led to rise in safeguarding species ecological domain. With natural habitat of the endangered Panthera Tigris Tigris fast declining, coupled with factors such as loss in genetic diversity and disruption of ecological corridors there is an urgent need to conserve and reintroduce it to newer geographic locations. The study aims to predict and model distribution of the species Panthera Tigris Tigris by combining various climatic, human influence and environmental factors so as to predict alternate ecological niche for the already dwindling tiger habitats in India. 19 Bioclimatic variables, Elevation level, 17 Land Cover classes, Population Density and Human Footprint data were taken. MAXENT, SVM, Random Forest and Artificial Neural Networks were used for modelling. Sampling bias on the species was removed through spatial thinning. These variables were tested for Pearson correlation and those having coefficient greater than 0.70 were removed. Kappa statistic and AUC were used to study the results of the methodology implemented. Testing data comprises 25% of the presence only points and test AUC value of MAXENT was found to be the highest at 0.963, followed by RF at 0.931, ANN at 0.906 and lastly SVM at 0.898. These indicated a high degree of accuracy for prediction. The most recent datasets were taken into consideration for the above variables increasing accuracy in both time and spatial domain.

Keywords: Artificial Neural Networks, Bioclimatic, Elevation, Environmental niche, Human Influence, Land cover, MAXENT, MODIS, Panthera Tigris Tigris, Random Forest, Royal Bengal Tigers, Species distribution modelling, Support Vector Machines

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ORGANIZATIONAL DIGITAL FOOTPRINT FOR TRACEABILITY, PROVENANCE APPROACH

Sheetal Arya^a, Kumar Abhishek^b, Akshay Deepak^c

Abstract

In this age of instant noodles, instant messaging, tweeting we have all we want at the tips of our finger whether it be the delivery of a food product, buying a property or going for a date. All but a click away. As quoted “The control of information is something successful person does.” If one could control the information he would be able to make worthy decisions. Now the question arises, how does one know which information is relevant and which is fake, for making the foundation of decisions. Here comes the role of Provenance. In this paper, the characteristics of a data such as why, when, where, what, how and who are determined using PROV family of documents. Giving full structural format to data, determining all its characteristics and its existential source. Now all this provenance information describing all aspects of data when connected will generate a footprint. Apache NiFi has been used to show the flow of data and its manipulation. The digital footprint as it’s all in digital format can be traceable to determine a data trustworthiness i.e. its provenance. Hence, determining the reliability of an organization for merger, acquisition, data analysis, stock market, etc.

Keywords: Big Data; Provenance; Digital footprint; Knowledge representation

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BI-DIRECTIONAL LONG SHORT TERM MEMORY FOR AUTOMATIC ENGLISH TO KANNADA BACK-TRANSLITERATION

Sowmya Lakshmi B S^a, Dr.Shambhavi B R^b

Abstract

Transliteration is the key component in various Natural Language Processing (NLP) tasks. Transliteration is the process of converting one orthographic system to another. This paper demonstrates transliteration of Romanised Kannada words to Kannada script. Our system utilizes a bilingual corpus of around one lakh words, which comprise pairs of Romanised Kannada word with its corresponding word in Kannada script and employs orthographic and phonetic information. Recurrent Neural Networks (RNNs) are widely used Neural Networking model for text and speech processing as they better predict the next word based on past information. Long Short Term Memory (LSTM) Networks are exceptional kind of RNNs which handles long term dependencies. A Character level Bidirectional Long Short Term Memory (BLSTM) paradigm which drives down the perplexity with respect to word-level paradigm has been employed. Knowledge of Characters uncovers structural (dis)similarities among words, thus refining the modelling of uncommon and unknown words. Test data of 3000 Romanized Kannada words is used for model evaluation and we obtained an accuracy of 83.32%.

Keywords: Transliteration; Bilingual Corpus; RNN, LSTM.

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A DOMINANT POINT BASED ALGORITHM FOR FINDING MULTIPLE LONGEST COMMON SUBSEQUENCES IN COMPARATIVE GENOMICS

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Abstract

Finding a longest common subsequence is a classic and well-studied problem in the field of computer science and considered as an NP hard problem. There are many application of LCS in the field of Bioinformatics, Computational genomics, image processing and file comparison etc. There are many algorithm are present to find the similarity between the given strings and its special cases. As there is a tremendous increase in the biological data and it requires an efficient mechanism to deal with them, many efforts have been taken to reduce the time and space complexity of the given problem. In this paper, we presented a novel algorithm for the general case of multiple LCS problems, i.e. finding a longest common subsequence in the given two strings. Our algorithm works on dominant point approach to compute the LCS of the given string. When applied to multiple strings of length each 1000, 2000,3000, 4000 and 5000, characters, it is found that our algorithm work two or three magnitude faster than existing algorithm and it requires less space compare to existing algorithms.

Keywords: Longest common subsequence (LCS), Dynamic programming, Np-Hard Problem, Dominant point, Problem complexity, Comparative Genomics.

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FAST AND ACCURATE FINGERPRINT RECOGNITION IN PRINCIPAL COMPONENT SUBSPACE

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Abstract

In the case of fingerprint based person recognition, the most widely used discriminating features are minutiae (end points and bifurcations of ridges). Majority of fingerprint matching algorithms are dealing with comparing the parameters directly derived from or relative to minutiae points extracted from the templates. Hence eventually fingerprint matching based on minutiae can be reduced to a 2D point set matching problem. Various security pitfalls like impersonation using one's minutiae coordinates and performance issues related to enhancement as well as spurious minutiae removal are obvious in such a system. Certain non-minutiae based schemes are able to give acceptable performance at the cost of increased complexity which results in increased execution time. In order to overcome these issues, we propose a simple yet efficient and faster fingerprint alignment and matching scheme based on statistical features which will not reveal the unique local features of the template. Proposed matching technique is based on the weighted similarity score obtained by comparing the principal component subspaces of fingerprint templates. Proposed method also utilizes an alignment scheme based on principal components calculated for the 2D coordinates of fingerprint region with minimal overhead without any helper data

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SMART METER ANALYSIS USING BIG DATA TECHNIQUES

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Abstract

In a preset day many government firms and global companies pays emphasis on energy conservation and efficient use of energy. The smart meter data have mapped a way to use energy efficiently. The need to use energy in an efficient way is very much required for developing countries like India. The emergence of smart meter gave us access to huge amounts of energy consumption data. It is an electronic component that records utilization of electric energy at regular intervals of time ,be it hours, minutes or seconds. This paper proposes a different method for grouping electricity consumption. Through smart meter we get a huge amount of energy consumption data. These data are analyzed by various energy distribution companies which further leads to prediction of demand and consumption of user. Our paper uses a business intelligence tool such as map reduction to handle these data sets. Taking the advantage of this tool, energy distribution companies can reduce the investment by making the use of community hardware. Using distributed computing tools we can reduce the processing time appreciably to enable real time monitoring and decision making. Further R is integrated to it to perform analysis. Various data sets are used to check the potential of the proposed models and approaches.

Keywords: Smart Meter Data, Meter Data Analysis, Big Data Analytics, Hadoop, Map Reduction, HDFS

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MOVIE RECOMMENDATION SYSTEM

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Abstract

Recommender systems are called information filtering tools which use the big data to recommend likes of the user according to their preference and interest. Moreover they also help in matching users with similar tastes and interests. Due to this a central part of websites and e-commerce applications is taken up by the recommender systems.

Systems using recommendation algorithms like Collaborative Filtering, Content-Based Filtering etc. are called Recommendation systems. Recommendation systems are transforming the way quiescent websites corresponds with their users. Rather than providing an orthodox experience in which users search for the products which they want and potentially buy products, recommender systems increase communication to provide a better experience. The work would be to to implement both collaborative as well as content based recommenders available and try to extend the knowledge obtained to a more efficient hybrid model. Then benchmark these hybrid algorithms for accuracy and computation time as well.

Keywords: Recommendation systems, Collaborative, Cosine similarity, SVD, Machine Learning, Python, Surprise library

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A SEMI-AUTOMATED QUESTION PAPER BUILDER USING LONG SHORT-TERM MEMORY NEURAL NETWORKS

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Abstract

Through this research, we propose a model to generate different sets of question paper automatically using deep learning methodologies. We first develop LSTM classification models to classify questions into Blooms level of taxonomy, chapter name and we have a LSTM prediction model to predict the marks to be allocated. These Deep Learning techniques can help in reducing human effort in deciding the marks, the section, and Bloom's level to be allocated to a question. Given a pool of hundreds of questions, our deep learning models develop a knowledge base consisting of questions and predicted attributes marks, Bloom's level, and chapter name. We then we have a randomization algorithm to pick the questions for different units of the question paper, keeping the standards to be maintained and even distribution of questions across all topics.

Keywords: Bi-Directional Long Short-Term Memory Networks, Randomisation technique, classification.

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TIME-CRITICAL TRANSMISSION PROTOCOLS IN WIRELESS SENSOR NETWORKS: A SURVEY

Archana R. Raut^a, S. P. Khandait^b, U. N. Shrawankar^c

Abstract

Wireless Sensor Network (WSN) is an extremely important tool for closely monitoring, understanding and controlling application processes to the end users. The main purpose behind installing the wireless sensor network is to take real-time decisions based on data received from the sensor nodes. This data transmission from sensor nodes to the base station is considered to be very complicated because of the resources and communication capability constraints of various sensor nodes and enormous amount of data is generated by WSNs. Real-time applications in WSN like mission-critical monitoring, surveillance systems etc. demands well-timed and reliable delivery of data. For such applications, besides energy, Quality of Services (QoS) routing i.e. requirement of message delivery timeliness is also one of the significant issues. Based on the type of application it is essential to grant different levels of QoS in WSNs. In this paper QoS requirements for mission-critical WSNs applications are highlighted and existing QoS aware protocols to support such applications are discussed with their boundaries in that domain.

Keywords: Wireless sensor network, quality of service, mission-critical, delay, reliability.

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IMPACT OF SHUFFLER DESIGN PATTERN ON SOFTWARE QUALITY

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Abstract

Modern software has become intricate and versatile due to the worldwide growth of new software technologies. In this regard, the evolution of software quality metrics to support software maintainability is studied. The impact of Shuffler design pattern on software quality metrics is evaluated in this paper. The Shuffler design pattern provides an efficient design approach for shuffling. The pattern helps to choose generic shuffling alternatives that make the client program loosely coupled and thus attaining high reusability. A few software quality metrics, which has a higher influence on software reusability and maintainability, are experimented on three gaming applications like Jigsaw, Poker and Scramble. These gaming projects are redesigned using Shuffler design pattern and a combination of other patterns. The three software quality metrics, which show improvement on the redesigned projects, are McCabe Cyclomatic Complexity, Lack of Cohesion of Methods and Specialization Index. The authors also have tested the pattern with another reusability metrics suite, which measures the reusability of the black-box components of the aforementioned projects without any source code. The results with high cohesive and low coupling values would help software designers in the industry to be more confident in using the Shuffler pattern along with other design patterns. The interdependence of the three software metrics on the software quality attributes is finally tabulated to show their impact on software quality.

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EFFICIENT ALGORITHMS FOR TEXT LINES AND WORDS SEGMENTATION FOR RECOGNITION OF ARABIC HANDWRITTEN SCRIPT

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Abstract

A new methodology for Arabic handwritten document images segmentation is done in this paper to segment the documents into their distinct entities as words and text lines. Based on features of Arabic scripts the document images divided into three main subsets of connected components where the Hough transform method is applied on them to achieve text lines segmentation. To enhance the result by avoiding the Hough transform text line detection failed, the authors used a method in post processing stage based on skeletonization that covers the possible false correction alarms to create proficiency vertical connected characters' segmentation. The segmentation of the Arabic words is pointed as a two class problem. The authors used fusion of Convex and Euclidean distance metrics to calculate the distance between neighboring overlapped components, which in the Gaussian mixture modelling framework is classified as a distance of an intra-word or as an inter-word. The proposed method performance is depended on a constant and particular evaluation method that appropriate measures of the performance used to compare the segmentation of our result against the other strong researcher result. The proposed method efficiency showed with high accuracy in the experimentation which conducted on two various Arabic Handwriting datasets which are IFN/ENIT and AHDB.

Keywords: Gaussian mixture modelling, Handwritten document images, Hough transform, Word segmentation, Text line segmentation.

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PRIVACY-PRESERVING LIGHTWEIGHT IMAGE ENCRYPTION IN MOBILECLOUD

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Abstract

With the rapid development of mobile cloud, multimedia data like image is a major challenge to maintain security and privacy for mobile users. Encryption is one of the best solution to protect data. But traditional encryption algorithms are not suitable for images which they were proposed for text data. In this paper, we propose an image encryption technique called privacy-preserving lightweight image encryption(PPLiIE) to make an encryption in a simple way, suitable for images and to maintain privacy. PPLiIE algorithm proceeds with three step process to secure the image data in mobile before storing to the cloud. We implement in python language and analyze our results with various file images to conclude that the encryption time of the PPLiIE is reduced 50% approximately than the encryption time of AES. In addition, the measurement of key sensitivity and file with variation of chunk size are expressed the superior performance of PPLiIE. Finally, we review various security attacks against PPLiIE to express the security level.

Keywords: Mobile cloud, Data privacy,image, AES, Mobile computing, cloud computing.

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PERFORMANCE EVALUATION OF ENSEMBLE BASED MACHINE LEARNING TECHNIQUES FOR PREDICTION OF CHRONIC KIDNEY DISEASE

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Abstract

Chronic kidney disease (CKD) is widespread and linked with enhanced risk of cardiovascular disease and end-stage renal disease, which are possibly escapable through early detection and treatment of individuals at risk. Machine learning algorithm aids medical experts to diagnose the disease correctly in earlier stage. Therefore, machine predicted analysis has become very popular in recent decades that can effectually recognize whether a patient has a certain kidney disease or not. In this regard, we propose ensemble method based classifier to improve the decision of the classifiers for kidney disease diagnosis efficiently. Ensemble methods combine multiple learning algorithms to achieve better predictive performance than could be obtained from any of the constituent learning algorithms alone. In addition, Data is evaluated by using 10-fold cross validation and performance of the system is assessed on receiver operative characteristic curve. Extensive experiments on CKD datasets from UCI machine learning repository show that our ensemble based model achieves the state-of-the-art performance.

Keywords: Machine learning, Classification, Chronic Kidney disease (CKD,) Ensemble method, Data Mining, Health Care Informatics.

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PROFICIENT COOPERATIVE CACHING IN SWNET USING TWIN SEGMENTS APPROACH

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Abstract

Web caching is a main practice to scale the internet. One chief performance aspect of web caches is the replacement strategy. The most prominent system to let an array of distributed caches to cooperate and serve each other is web requests is Cooperative caching. In the existing cooperative caching schemes most of them won't provide high network level availability and high node level availability at the dupe time. The feasibility of the object is ensured by network level in isolated network partitions and node level in individual nodes when they are completely detached from the all of the network. To reduce electronic content provisioning cost in Social Wireless Network(SWNET), its recommended to use cooperative caching policies. Social Wireless Networks are designed by mobile devices, like Android, iPhone, Kindle etc., giving out similar interests in electronic information, and physically congregating in public areas. In Social Wireless Network, object caching are proved that it reduces the content provisioning cost which is massively dependent on the pricing factors within several stakeholders like End Consumers, Content Service Providers, and Network Service Providers.

Keywords—SWNET, Twofold, ad hoc network.

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A PARTICLE SWARM OPTIMIZATION- BACKPROPAGATION (PSO-BP) MODEL FOR THE PREDICTION OF EARTHQUAKE IN JAPAN

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Abstract

Japan is a country that suffers lot of earthquakes and disasters because it lies across four major tectonic plates. Subduction zones at the Japanese island curves are geologically complex and create various earthquakes from various sources. Earthquake prediction helps in evacuating areas which are suspected and could save lives of people. Artificial neural network is a computing model inspired from biological neurons which learns from examples and can be able to do predictions. In this paper we present an artificial neural network with PSO-BP model for the prediction of earthquake in Japan. In PSO-BP model, particle swarm optimization method is used to optimize the input parameters of Back-propagation neural network. Information regarding all major, minor and aftershock earthquake is taken into account for the input of back-Propagation neural network. These parameters are taken from Japan seismic catalogue provided by USGS (United States Geological Survey) such as latitude, longitude, magnitude, depth etc of earthquake.

Keywords: Tectonic plates, Artificial neural network, Particle swarm optimization, Back Propagation, Seismic catalogue.

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ANALYSIS AND DETECTION OF DIABETES USING DATA MINING TECHNIQUES – A BIG DATA APPLICATION IN HEALTHCARE

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Abstract

In digitized world, data is growing exponentially and Big Data Analytics is an emerging trend and a dominant Research field. Data Mining techniques play an energetic role in the application of Big Data in Healthcare sector. Data Mining Algorithms give an exposure to analyse, detect and predict the presence of disease and help doctors in decision making by early detection and right management. The main objective of Data Mining Techniques in Healthcare systems is to design an automated tool which diagnoses the medical data and intimates the patients and doctors about the intensity of the disease and the type of treatment to be best practiced based on the symptoms, patient record and treatment history. This paper emphasises on Diabetes medical data where Classification and Clustering Algorithms are implemented and the efficiency of the same is examined.

Keywords: Big Data Healthcare, Data Mining Techniques, Gaussian Naïve Bayes, OPTICS, BIRCH.

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CYCLIC SCHEDULING ALGORITHM

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Abstract

CPU Scheduling have played a critical role in making efficient systems, It is the mechanism which allows one process to use the CPU for execution while other processes are put on hold because of unavailability any required resource, with the aim of maximizing the CPU utilization and reducing the waiting time and the turnaround time. This paper presents a new Scheduling Algorithm, which supports preemption, reduces the turnaround time and the waiting time. To show its effectiveness, its comparison is done with other traditional scheduling algorithms including First Come First Serve, Shortest Job First, and Round Robin Scheduling Algorithm, and as a result it was found that the proposed algorithm provides a new and effective scheduling approach which reduces the average waiting time and average turnaround time in a much better way than the traditional approaches.

Keywords: Preemption, Scheduling, Resource Utilization, Waiting Time.

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A FRAMEWORK FOR MONITORING CLUSTERING STABILITY OVER TIME

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Abstract

Mining data streams and arriving at intelligent decisions is becoming more and more important nowadays as a lot of applications produce large volume data streams. Data stream clustering has been considered to be very useful for online analysis of streams. Monitoring the cluster transitions over time provide good insight into the evolving nature of the data stream. This paper introduces a framework for monitoring the stability of individual clusters and clusterings over time, along with the progress of the stream. Tracking the historical evolution of clustering structures is the main focus of this framework. Two real-world datasets have been used for conducting the experiments. The results point up the fact that monitoring the stability of clustering structures will help to get an important hint of the physical events happening in the environment. This information can be used to predict the future clustering structure changes and in turn the upcoming events.

Keywords: Data streams; clusters; evolution tracking;

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EFFICIENT DYNAMIC DOUBLE THRESHOLD ENERGY DETECTION OF COOPERATIVE SPECTRUM SENSING IN COGNITIVE RADIO

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Abstract

With the increasing number of wireless users every day, cognitive radio serves as an approach to solve the spectrum crunch problem. Spectrum sensing serves as the heart of cognitive radio with it being able to decide if an unlicensed user is to be given access to a licensed band or not without causing interference. Various spectrum sensing techniques have been discussed in the literature. In this paper energy detection is considered for spectrum sensing which conventionally works on a fixed threshold without requiring any prior knowledge of the signal. It is found the performance of conventional energy detection falls in regions with noise uncertainty. In this paper, a dynamic double threshold scheme along with cooperative spectrum sensing at the fusion center is proposed. The dynamic threshold selection works on the parameter of noise uncertainty for practical cases by creating a noise variance history. Also, the fusion center uses a dynamic threshold to make a final decision compared to a fixed threshold for all the energy values lying between the two thresholds at the local nodes. A simulation model has been discussed to compare the proposed scheme with traditional energy detection and other detection schemes as well. A 20% improvement in probability of detection at -22 dB SNR and 0.5 probability of false alarm is achieved using the proposed scheme.

Keywords: Cognitive Radio, Spectrum sensing, Fusion Centre, Noise uncertainty, Probability of detection, Probability of false alarm

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CONVFOOD: A CNN BASED FOOD RECOGNITION MOBILE APPLICATION FOR OBESE AND DIABETIC PATIENTS

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Abstract

In recent years, obesity and health of diabetic patients have become major issues. To address these issues, it is very important to know the intake of calories, carbohydrates and sugar. We propose a novel deep learning convolutional neural network based image recognition system that can run on android smartphones, that not only provides the appropriate nutritional estimates to users after passing a food image as input, but also suggests alternative food recipes for diabetic patients. We have implemented transfer learning as well as fine-Tuning and our CNN model was able to achieve comparatively higher accuracy than other approaches that used a similar setup on the Food-101 dataset. By user experiments and approval from well-known doctors, effectiveness of the proposed system was confirmed. The future scope includes expanding to more food categories and optimising the model for better results.

Keywords: Convolutional Neural Networks · Deep Learning · Obesity · Diabetic Patients · Smartphone

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SEGMENTATION AND RECOGNITION OF E.COLI BACTERIA CELL IN DIGITAL MICROSCOPIC IMAGES BASED ON ENHANCED PARTICLE-FILTERING FRAMEWORK

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ABSTRACT

Image processing and pattern recognition plays an important role in biomedical image analysis. Using these techniques one can aid biomedical experts to identify the microbial particles in electron microscopy images. So far many algorithms and methods are proposed in the state of the art literature. But still the exact identification of region of interest in biomedical image is a research topic. In this paper E-coli bacteria particle segmentation and classification is proposed. For the current research work the hybrid algorithm is developed based on Sequential Importance Sampling (SIS) Framework, particle filtering, and chanvese level set method. The proposed research work produces 95.50% of average classification accuracy.

Key words : Image Segmentation, sequential importance sampling, particle filtering, chanvese level set method, minimum distance classifier.

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AUTOMATIC BENGALI DOCUMENT CATEGORIZATION BASED ON DEEP CONVOLUTION NETS

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Abstract

Automatic document categorization has gained much attention by natural language processing (NLP) researchers due to the enormous availability of text resources in digital form in recent years. It is the process of assigning a document into one or more categories that helps the document manipulate and sort quickly. An efficient information processing system is required due to the rapid growth of Bengali text contents in digital form for searching, organizing and retrieving tasks. In this paper, we proposed a framework for classifying Bengali text documents using deep convolution nets. The proposed framework consists of word embedding and document classifier models. Experiments with more than one million Bengali text documents reveals that the proposed system worthy of classifying documents with 94.96% accuracy.

Keywords: Bengali language processing, Document categorization, Word embedding, Deep convolution neural nets.

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ARTIST RECOMMENDATION SYSTEM USING HYBRID METHOD: A NOVEL APPROACH

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Abstract

Recommendation systems have a wide range of applications today in the digital world. The recommender system must be able to accurately predict the users' tastes as well as broaden their horizon about the available products. There are various dimensions on which recommendation systems are created and evaluated. Accuracy and diversity play an important role in the recommendation systems and a trade-off must be identified between the two parameters to suit the business requirements. The proposed system makes use of a various recommendation approaches to give a wide range of recommendations to users. The recommendations are provided based on similarity of the selected artist, top artists in a genre, using a hybrid model and artists listened by users' friends. Some recommendations would include the most popular ones, and some would be randomly picked for a diverse range of recommendations.

Keywords: Collaborative Filtering; Diversity; Hybrid Model; R; Recommender Systems

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ANOMALY DETECTION OF DDOS ATTACKS USING HADOOP

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Abstract

A Distributed Denial of Service is one of the major threats in the cyber network and it causes the computers have been flooded with the HTTP GET Packet. As Http Flood attacks used standard URL requests it is quite challenging to differentiate from valid traffic. In an Http flood, the Http clients such as web browser interact with the application or server to send Http requests. The request can be either GET or POST. The aim of attack is when to compel the server to allocate as many resources as possible to serving the attacks, thus denying legitimate user's access to the server's resource. To handle this DDOS attack the traditional Intrusion detection system is not suitable to hold and find the huge amount of data in the network. Hadoop is a framework that allows processing and storing huge data sets. In Hadoop Map Reduce is the programming model to process huge data stored in Hadoop. This paper explains the how to detect the HTTP Flood attack using KDD CUP 99' Data set with improvised the algorithm in Map Reduce using anomaly detection strategy.

Keywords: Hadoop, HTTP GET, Map Reduce.

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PEDESTRIAN DETECTION AND TRACKING: A DRIVER ASSISTANCE SYSTEM

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Abstract

Detection and tracking of pedestrian is a challenging task due to variable appearances, wide range of poses and irregular motion of pedestrian along with motion of tracking camera under complex outdoor environmental conditions. In this paper we propose an algorithm for pedestrian detection and tracking using HOG descriptors and particle filtering technique. A robust algorithm for pedestrian detection is proposed which works under nonlinear motion and overcomes occlusions. The performance of the above algorithm is tested for outdoor environment using standard dataset. The particle filter has benefits of handling nonlinear motion and occlusions, and they concentrate consecutively on the higher density regions of the state space and it is simple to realize which provides a robust tracking environment. Performance comparison of particle with conventional kalman is also presented for the above said cases.

Keywords: Histogram of Oriented Gradients (HOG), Support Vector Machine (SVM), particle filter, kalman filter

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EXPLOITING PARALLELISM AVAILABLE IN LOOPS USING ABSTRACT SYNTAX TREE

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Abstract

Performance of a program depends on two factors: better hardware of the executing machine and exploiting parallelism for concurrent execution. Loops with multiple iterations provide efficient parallelism in an application, are used to reduce overall execution time and also to increase performance. Abstract Syntax Tree (AST) can be used as an effective tool for exploiting parallelism at the compiler level. This definitely saves time and automates the decomposition of a parallel job that is to be executed in parallel framework. AST can be used to detect loops in the source code, therefore this approach can be used to design a new parallel computing framework where simple codes written for normal machines can be parallelized by the framework itself.

Key words: Parallel Computing, Abstract Syntax Tree, Job Decomposition, Parallelism, Parallel Framework.

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A STUDY ON COOPERATION AND NAVIGATION PLANNING FOR MULTI-ROBOT USING INTELLIGENT WATER DROPS ALGORITHM

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Abstract

The shortcomings of existing multi-robot navigation planning methods in an unknown environment is studied extensively. An efficient approach for resolving these issues is addressed in the current study using a novel nature inspired Intelligent Water Drops (IWD) algorithm. The robustness of the proposed method for multi-robot navigation in an unknown environment is validated through V-Rep simulator. The performance of the algorithm is verified through simulation outcomes in terms of total path travelled, total path deviation, number of turns and execution time. Further, the efficiency of the proposed method is compared with the existing state-of-the-art to verify its potency. The simulation outcomes reveals that the proposed method takes in an improvement of 9.93%, 35.26%, 33.33% and 13.04% in terms of the total path travelled, total path deviation, number of turns and total execution time for all the robots to arrive their target respectively as compared to the existing state-of-the-art. Moreover, the current study confirms the superiority of the proposed approach as compared to the existing state-of-the-art in terms of generating optimal and safe navigation path for individual robots.

Keywords: Multi-robot; Navigation planning; Waypoints; Intelligent water Drops; Static environment;

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CUSTOMER'S ACTIVITY RECOGNITION IN SMART RETAIL ENVIRONMENT USING ALTBEACONS

Lakshmi M^a, Alolika Panja^b, Naini^c, Shakti Mishra^d

Abstract

SRMS (Smart Retail Management System) is a project based on IoT (Internet of Things) which is an upcoming technology that deserves the attention of the industry. IoT provides unique identifiers to objects and people and transfers data over a network without any interaction of human to human or human to computer, for example tracking your activity level at real time basis. In this project we will be empowering retail stores with the power of IoT. In this project we will be sending tailored offer schemes to the customer of the store whenever he/she is in the radius of a beacon of a particular shelf in store. This process in turn will help the customers to get specific offers for happier customer experience and will aid managers of the stores to better analyze the trends of the customers and create appropriate deals to attain higher profits with proper management of inventory.

Keywords: Virtual beacons (Altbeacon), Smart Retail Management System, Consumer behaviour analytics, Location tracking, Push notification, BLE (Bluetooth Low Energy) devices

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AN ACTIVE MIXER DESIGN FOR DOWN CONVERSION IN 180NM CMOS TECHNOLOGY FOR RFIC APPLICATIONS

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Abstract

This paper introduces a component of the radio frequency transceiver called the mixer. Mixers are found in almost all the communication systems at the front end. Radio frequency mixing is a key process within the RF technology and RF design. It is a non-linear process that involves one signal level affecting the other signal level at the output side instantaneously. The mixer design has the following design parameters Conversion gain, Linearity, Noise Figure and port isolation. It is important to have better isolation between the ports as it is the measure of leakage or feed through from one port to another. Poor isolation leads to mixing of unwanted dripped signal with desired output signal creating inter-modulation products and adding distortion. The proposed Gilbert mixer is intended to produce IF frequency range of 1MHz in UMC180nm CMOS technology with a conversion gain of 8dB, Noise figure of > 10 dB, RF frequency range 5.001GHz, reverse isolation > 15 dB and a stability factor of 1 at a low operating voltage of 1.8V using a double balanced topology. The mixer being designed provides a better isolation factor between the ports with less power dissipation of < 10 mW.

Keywords: Gilbert Mixer, Conversion gain, noise figure, port isolation, UMC technology.

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ANALYSIS OF PAPR FOR PERFORMANCE QPSK AND BPSK MODULATION TECHNIQUES

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Abstract

In both wireless and wired communication environments there is demand for larger data rates, which is continuously increasing day by day. Hence OFDM systems have been developed for digital systems. These systems have many advantages over single carrier transmission systems like resistance to selective fading. But these systems are characterized by large value of PAPR. Many methods have been discussed in the literature for the reduction in PAPR value. Although these methods provide the reduction, they affect the transmission power, data transmission rates, error rates and complexity in the computational model. One of the simplest way of measuring PAPR is CCDF. In this paper, CCDF curves are used to measure the amount of PAPR in OFDM systems and are analyzed

Keywords: CCDF-Complementary cumulative distributing function, OFDM-Orthogonal Frequency Division Multiplexing ,PAPR-Peak to Average Power Ratio , clipping, subcarriers, MIMO- Multiple Input Multiple Output

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IMPLEMENTATION OF MODIFIED ARRAY MULTIPLIER FOR WIMAX DEINTERLEAVER ADDRESS GENERATION

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Abstract

One of the simpler technique, which involves the implementation of generating the address of two dimensional deinterleaver used in the WiMAX transmitter and receiver block is proposed using the Xilinx FPGA. The Arithmetic and Logic Unit performs various mathematical operations such as addition, subtraction, division and many other logical operations. Apart from these operations, Multiplication is one of the most fundamental operation to be carried out by this unit. The implementation of multipliers is required for the address generation of the channel interleaver. The multipliers needs to be designed in such a way that they require high speed, low power, less area and less delay which is of significant interest in research area. Many attempts have been carried out to reduce the generation of number of partial products in the process of multiplication. Array multiplier is one such multiplier. Most of the arithmetic operations will be performed using multipliers which consumes the majority amount of the power in digital circuits. The process of multiplication involves the shift and add operations. The performance of multiplier can be improved by optimizing the adder circuit. The objective of this paper is to build the algorithm for generating the address of channel deinterleaver by using modified array multiplier. The algorithm is built using the Hardware Description Language Verilog and the functioning of the system can be verified through simulation and implemented using the Spartan-6. The simulation and implementation results have been obtained for the three different modulation techniques such as QPSK, 16-QAM and 64-QAM for some of the information rates which proves to be a very good technique against the conventional methods.

Keywords: Field-Programmable Gate Array(FPGAs), Multiplication, Array multiplier

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LINK QUALITY BASED MOBILE CONTROLLED HANDOFF ANALYSIS USING STOCHASTIC MODELS

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Abstract

With limited available frequency spectrum and increasing demand for cellular communication services, the problem of handoff becomes increasingly important. Poorly designed handoff schemes tend to generate very heavy signaling traffic and thereby, a drastic decrease in the quality of service (QoS). In urban mobile cellular radio system, the cell size is small. The handoff procedure has significant impact on the system performance. Blocking probability of originating calls and forced termination probability of ongoing calls reflects the performance of the system. In this paper, we use mobile-controlled handoff process. MS is moving from one cell to another cell. Relative signal strength and relative residual energy are measured. Important channel quality parameters, for the channels with line-of-sight (α) and without line-of-sight (β) are considered. Using these parameters weights of the channels are determined in three neighboring cells and the servicing cell. The channel weights of four cells are compared with chosen signal strength threshold value to make a decision of handoff process or to continue service with the same Base station (BS). Prioritized hard handoff is preferred in the work. Handoff performance metrics such as arrival rate of originating calls, blocking probability of originating calls, arrival rate of handoff calls, blocking probability of handoff calls, and network parameters such as sender window size, queue length at the servicing link are measured. Performance analysis parameters such as packet loss due to congestion, round trip delay and throughput are discussed. It helps in controlling the oscillatory behavior of the switch or router normally used for traffic control at the BS. Using the results and applying an explicit feedback, the link congestion and packet losses can be minimized. It helps for improving the quality of service (QoS) in 3G, 4G and next generation mobile communication. Stochastic models are used to analyze the system performance. Using MATLAB programme, result analysis is made through graphs and statistical data.

Keywords: Cell, Congestion, Hard handoff, Mobility, Probability, Stochastic.

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A COMPARATIVE ANALYSIS OF LIGHTWEIGHT CRYPTOGRAPHIC PROTOCOLS FOR SMART HOME

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Abstract

Smart Home is an application of Internet of Things. A smart home is a network of smart resource constraint devices which require secure and confidential transmission of information. Lightweight cryptographic protocols are suitable for IOT applications like Smart Home. Lightweight cryptographic protocols are characterized by small key size, small block size and less number of iterations. This paper presents a comparative analysis of lightweight cryptographic protocols in terms of the encryption type, advantages and resistance to attacks.

Keywords: Internet of Things, Lightweight cryptography, Smart Home

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ALGORITHM STUDY AND SIMULATION ANALYSIS BY DIFFERENT TECHNIQUES ON MANET

Dr. Nithya Rekha Sivakumar^a, Dr.Abeer Al Garni^b,

Abstract

This paper provides a protocol in ROUGH method which governs APBMAN method and FLOODING method to manage the route request packets on Fisheye State routing in Grid. ROUGH method finds the runner node set by the discovery of the similarity relation between the 1-hop and 2-hop neighbors. In this paper comparison is made with the results of three techniques such as ROUGH method, FLOODING method and APBMAN method in Grid FSR protocol. It is found that ROUGH method has shown improved performance in several important parameters like Throughput, energy consumption, Packet Delivery Ratio, Delay, Overhead and Normalized Overhead with respect to Pause-time. Certainly ROUGH Method is good with effect to Speed in Average consumed energy, Total Consumed energy, Packet Delivery Ratio and Throughput. But there is a certain increase in Delay as there is also an increase in speed. Delay is well decreased in FLOODING method.

Keywords: Weighted Rough Set (ROUGH), Propagation Neighborhood Information Algorithm (FLOODING) and Probabilistic Broadcasting Algorithm (APBMAN), Speed, Pause Time.

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CLOUD BASED AGRICULTURAL FRAMEWORK FOR SOIL CLASSIFICATION AND CROP YIELD PREDICTION AS A SERVICE

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Abstract

Agriculture is one of the important occupations in India. Digitization in the field of Indian agriculture is in the initial stage. Indian farmers are suffering from various issues such as ignorance about soil parameters and inability to predict yield of crops. Also, various agriculture related information from Government agencies are not communicated to the farmers. To address the above said issues, we have built a cloud based agricultural framework which enables the Indian farmers, agricultural departments and agro-industries to extract useful agricultural information. The designed agricultural cloud framework is providing two services i.e. soil classification as a service and crop yield prediction as a service. For soil classification, hybrid support vector machine (M-SVM) and for wheat yield prediction customized artificial neural network (M-ANN) were developed. To store the agricultural data, we are using Amazon S3 and for deployment of the services we have used heroku cloud. Performance improvements in the range of 2% to 43%, 4% to 35% and 1% to 11% were observed for M-SVM with respect to k-Nearest Neighbour (k-NN), Naïve Bayes (NB) and standard SVM classifiers respectively. M-ANN performed with an improvement of 2% over standard artificial neural network (ANN) and 5% over multiple linear regression (MLR) models. We also observed that our agricultural cloud framework is able to provide reliable and accurate agricultural services.

Keywords: Agriculture, Classification, Prediction, Cloud, Framework.

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USE OF BLOCKCHAIN FOR SMART T-SHIRT DESIGN OWNERSHIP

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Abstract

This study aims to provide a reliable solution for the T-shirt designer to gain ownership of his design using the blockchain technology. As blockchain is a decentralized technology it will provide authentication for the ownership of the artwork among various non-trusting members. In this research paper we have explained how to resolve this issue for the designer as well as the customer. Using this method a novel distributed application can be created.

Keywords: Bitcoin, Blockchain, Smartcontract, Suplychain

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A FEASIBILITY STUDY AND SIMULATION OF 450KWP GRID CONNECTED SOLAR PV SYSTEM AT NMIT

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Abstract

The consumption of energy can be reduced by efficiently using the available resources and effectively energy bill is reduced by considering photovoltaic system, which is most promising nowadays. In this paper a feasibility study and simulation model on MATLAB/Simulink of 450KW grid connected solar PV system is considered for NMIT campus. The energy consumption at the campus is studied and the number of billed units in kWh is considered for the last two years. The modelling of PV array, their integration with MPPT in Simulink environment are described. The deployment of available energy resources along with the incoming PV system is studied for effective usage of electricity. The simulation results are shown, the performance of the incoming PV system and its feasibility is described as obtained.

Keywords: Fossil fuel, Solar PV system, MPPT, Simulink.

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PREDICTION OF A DAM'S HAZARD LEVEL - A CASE STUDY FROM SOUTH AFRICA

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Abstract

South Africa has a vast infrastructure of dams. Since the country receives very little rainfall, so these dams assume prime importance in storing water and sustaining agriculture, industry, household etc. Thus prediction of their multiple hazard levels (in this case, three) is of prime importance. In addition, South Africa lacks skilled personnels to classify these dam's hazards. Under such a framework, this work is an application of single and ensemble decision trees in a multi class supervised learning framework to predict the hazard level of a dam. The result obtained are highly promising and at is above 94%. With the implementation of the algorithm, we expect to address the problem of paucity of skilled personnels.

Keywords: Dam hazard level prediction, Multiclass classification, Imbalanced classes, Decision trees, C5.0, Tree bagging, Random forest, t-SNE, South Africa.

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ELEMENTAL RACING

Siva Karthik Reddy^a, Karthik Koka^b, Amiya Kumar Dash^c, Prof. Manjusha Pandey^d

Abstract

This paper presents a 3D Motion Sensor Racing Game for Android/iOS devices called Elemental Racing, in which players can race a car against opponent racers connected through Local Area Network. There are many popular Racing Games for mobile phones like Asphalt 8, Real Racing 3, and NFS et al. These have dominated the Android Racing Game Market with their extensive graphics and detail, but they are lacking when it comes to newer Gameplay Mechanisms, the objective of this game is to provide a fun yet intelligent experience to the player. To guarantee these objectives, we have consolidated multiple strategic upgrading mechanisms in the game which makes use of the concepts of elemental powers like Fire, Water, Wind, Lighting, and earth.

Keywords: 3D Android Motion Sensor Racing Game, Online/Offline Multiplayer, Strategic Combative Gameplay, Fire, Water, Wind, Lightning and Earth

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A SURVEY ON EXISTING CONVOLUTIONAL NEURAL NETWORKS AND WASTE MANAGEMENT TECHNIQUES, AND AN APPROACH TO SOLVE WASTE CLASSIFICATION PROBLEM USING NEURAL NETWORKS

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Abstract

In India, waste management has become one of the major crises with population explosion, coupled with improved life style of people, results in increased generation of solid wastes in urban as well as rural areas of the country. It is well known that waste management policies, as they exist now, are not sustainable in the long term. Thus, waste management is undergoing drastic change to offer more options that are more sustainable. Most of the landfills are becoming full of waste in which most part is reusable and leading to spreading of disease damaging human body and leading to unpleasant air and only 5% of whole waste is actual waste. The government of Karnataka mandated system of 2Bin1Bag to be adapted at every households in Bangalore, 2Bin 1Bag is a color coded system consisting of green bin which holds garden waste and the waste that are compostable, reject waste can be thrown in red bin, finally a big category called as reusable bag which holds recyclable waste. Segregation of waste at source is best solution and should be done properly. Types of waste need to be remembered by members of home in order to put them to proper bins, this may lead to human error. So our solution can answer this in good way, what if you just click picture of waste material and application says to which category it belongs. A Convolutional Neural Network is trained with images of waste materials and model can be inferred by giving waste material image as input and get the perfect category of waste material in a second. This helps society in dealing with prime problem of segregating waste materials at source.

Keywords: Solid Waste Management (SWM), 2BIN1BAG system, Convolution Neural Networks (CNN), Stochastic Gradient Descent (SGD), Neural Networks (NN).

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L1-REGULATED FEATURE SELECTION IN MICROARRAY CANCER DATA AND CLASSIFICATION USING RANDOM FOREST TREE

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Abstract

Microarray cancer data are characterized by high dimensionality, small sample size, noisy data and an imbalanced number of samples among classes. To alleviate this challenge several machine learning techniques are proposed by authors from several disciplines such as Computer Science, Computational Biology, Statistics and Pattern Recognition. In this work, we propose an efficient L1-regulated feature selection method and classification using Random Forest tree classifier. The experiment is conducted on eight standard Microarray cancer datasets. We explore the learning curve of the model, which indicates the learning capability from a different portion of the training samples. To overcome the overfitting problem, the learning curve is explored using 5-fold cross-validation method. Evaluation of the proposed method is carried out using several performance evaluation techniques such as classification accuracy, recall, precision, f1-measure, area under the curve and confusion matrix.

Keywords: Microarray cancer, Learning Curve, L1-regulated feature selection, Random Forest tree, Classification, Learning Curve

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AUTOMATED DELINEATION OF COSTOPHRENIC RECESSES ON CHEST RADIOGRAPHS

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Abstract

The lung image segmentation using a model based approach is a challenge owing to the sheer complexity and variability of the lung shape in a given data set. As a part of our effort to segment the lungs, we report a method to delineate the Costophrenic (CP) recess without the human intervention. Active Shape Model (ASM) is used to point to the probable area of the CP recess and a prior knowledge based processing delineates the CP recess and hence determine the angle. The proposed method is fast and shows satisfactory results. It is intended to be used as a preprocessing step in segmenting the lungs contour. The proposed method also can be used to initialize the model contour in any other ASM based lung segmentation algorithm. The algorithm was tested on 45 non-nodule lung images from the JSRT database. An average accuracy of 87.02% is achieved. A comparison of the results of proposed method and gold standard which is obtained by manual delineation is given.

Keywords: Costophrenic Angle, Active Shape Model, Lung Segmentation, Computer Aided Diagnosis, Sensitivity, Specificity, Jaccard Index

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USING LOCATION BASED SERVICE FOR INTERACTION

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Abstract

Traffic is one of the biggest global factors, affecting over 100 million people. People who live in places with large content of pollutants in air and have a 15-25% higher death risk from diseases like lung cancer, than people who live in less-polluted areas. This paper describes how Google Maps API interface can be used together with Google Cloud Console for location based interaction.

Keywords: Google Maps API, Google Console API, PHP.

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MODELING IMPLEMENTATION OF BIG DATA ANALYTICS IN OIL AND GAS INDUSTRIES IN INDIA

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Abstract

Stack holders have been anxious about the quality of performance in Oil and Gas industries in India and recommending technology intervention to drastically improve its performance. This investigation aims to analyze existing level of information and communication technology integration in Oil and Gas industries in India. All such industries which generate massive revenue are preparing to leverage Big Data Analytics (BDA) to build efficiencies and improve productivity by removing non-value adding activities. This paper also investigates to identify ways and means of applying BDA tools.

Keywords: Big Data Analytics · Information and Communication Technology Oil and Gas Industries.

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PRACTICAL MARKET INDICATORS FOR ALGORITHMIC STOCK MARKET TRADING: MACHINE LEARNING TECHNIQUES AND GRID STRATEGY

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Abstract

In this paper, market indicators from three different approaches for algorithmic trading are analysed (Moving Average Convergence Divergence (MACD) crossovers, Machine Learning (ML) label-based indicators, Grid Investing Strategy). Market indicators are used by traders in the stock market; to define entry and exit points of a trade. These indicators are also useful to compare different trading strategies. We take a practical stand for the approaches mentioned above, where the same data feed from the exchange is pre-processed to remove redundant or anomalous content. Furthermore, use of correlation data between different stocks is analysed. (i) MACD crossovers are dealt in two dimensions of variability, the dimensions being frequency of trades and length of trading intervals. (ii) The outputs of different algorithms are passed through a voting classifier to get the best possible accuracy in the ML label-based approach. Precision/ Recall analysis is done to qualify the algorithms for skewed data. (iii) Finally, a grid-based trading strategy is analysed. We conclude with a trading strategy, proposed using results of indicators based on the three approaches.

Keywords: MACD, Machine Learning, Grid Trading, Precision, Recall, Market Indicators.

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A REVIEW ON FEATURE SELECTION ALGORITHMS

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Abstract

Large number of data is increasing in multiple fields such as, social media, bioinformatics, health care etc. These data contain redundant, irrelevant or noisy data which causes high dimensionality. Feature selection is generally used in data mining to define the tools and techniques available for reducing inputs to a controllable size for processing and analysis. Feature selection is also used for dimension reduction, machine learning and other data mining applications. A survey of different feature selection methods are presented in this paper for obtaining relevant features. It also introduces feature selection algorithm called genetic algorithm for detection and diagnosis of biological problems. Genetic algorithm is mainly focused in field of medicines which can be beneficial for physicians to solve complex problems. Finally, this paper concludes with various challenges and applications in feature selection.

Keywords: feature selection, classification, wrapper method, genetic algorithm.

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A REVIEW ON ENSEMBLES BASED APPROACH TO OVERCOME CLASS IMBALANCE PROBLEM

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Abstract

Predictive analytics incorporate various statistical techniques from predictive modelling, machine learning, and data mining to analyse large database for future prediction. Data mining is a powerful technology to help organization to concentrate on most important data by extracting useful information from large database. With the improvement in technology day by day large amount of data are collected in raw form and as a result necessity of using data mining techniques in various domains are increasing. Class imbalance is an open challenge problem in data mining and machine learning. It occurs due to imbalanced data set. A data set is considered as imbalanced when a data set contains number of instance in one class vastly outnumber the number of instances in other class. When traditional data mining algorithms trained with imbalanced data sets it gives suboptimal classification model. Recently class imbalance problem have gain significance attention from data mining and machine learning researcher community due to its presence in many real world problem such as remote-sensing, pollution detection, risk management, fraud detection and medical diagnosis. Several methods have been proposed to overcome the problem of class imbalance problem. In this paper our goal is to review various methods which are proposed to overcome the effect of imbalance data on classification learning algorithms.

Keywords: Class imbalance, Bagging, Boosting, Classification, Ensemble, Sampling, Ensemble approach for class imbalance

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“COLLEGE EXPLORER” AN AUTHENTICATION GUARANTEED INFORMATION DISPLAY AND MANAGEMENT SYSTEM

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Abstract

The confusion and dilemma that arises out of unorganized plethora of information on internet can never help school pass outs to reach any conclusion of which college to join for higher studies. Apart from college information, internal environment and feedback from students currently studying in the college, is essential part to know about an institution and its administration. This paper stresses about the need for a web application like college explorer through the novel contributions, system model and advantages of the web application developed. It enables general public to view information such as placement details, admission details; course details etc. about the colleges. In addition the features like class notes sharing, notice publication (separate for students as well as for faculties of respective departments of the college), application of leave facility for both faculties as well as students is developed to manage the leave application even in emergency cases for smooth internal administration. The results confirm that web applications have the potential to address various problem statements stated using web technology efficiently.

Keywords: Web Technology, web application authentication, Information system, JDBC, MVC Architecture, JSP, Servlets.

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ACTIVITY BASED MUSIC CLASSIFIER: A SUPERVISED MACHINE LEARNING APPROACH FOR CURATING ACTIVITY BASED PLAYLISTS

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M. N. Thippeswamy^a and N. Pillay^d

Abstract

Classification of musical tracks and creation of playlists to match four primary activities such as Sleep, Party, Dinner and Workout, using concepts of Machine Learning (ML) and Musical Information Retrieval (MIR) is proposed in this paper. A dataset of songs using features extracted through Digital Signal Processing (DSP) are developed for training. In this work, several prominent and distinguishing features of individual musical tracks are employed. The ML algorithms used to classify the dataset are: Super Vector Machine (SVM), k-th Nearest Neighbour, Neural Networks and Voting Classifiers. The results show that the highest accuracy can be attained when classification is performed using the Voting Classifier compared to other algorithms. The increase in accuracy can be attributed to the voting classifier's ability to improve the individual classes' accuracy by utilizing multiple classifier outputs.

Keywords: Discrete Wavelet Transform (DWT), k-th nearest neighbour (kNN); Logistic Regression (LR), Music information retrieval; Machine learning (ML); music classification; Mel-frequency cepstrum coefficient; Random forest (RF), Spectral-centroid; SVM; Spotify.

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NEW PASSWORD EMBEDDING TECHNIQUE USING ELLIPTIC CURVE OVER FINITE FIELD

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Abstract

In the present sophisticated digital era safe communication of user password from one source to the other is quite difficult in client/server system. Also storing the password as it appears increases the potential risk of the security. Protection of the password is at most important in group communications to avoid the access of the illegal person to group resources. In addition a roaming user who uses the network from different client terminals requires access to the private key. The present paper explains secure communication of password from one entity to the other. Here the password is encrypted using elliptic curve over finite field, embedded in a large random text at different selected positions and communicated to the receiver via public channel.

Key words: Encryption, Decryption, Elliptic curve over Finite field

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PERFORMANCE OF WIND ENERGY CONVERSION SYSTEM DURING FAULT CONDITION & POWER QUALITY IMPROVEMENT OF GRID-CONNECTED WECS BY FACTS (UPFC)

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Abstract

The demand for the power generation from wind is constantly growing. This situation forces the revision of the grid codes requirements, to remain connected during grid faults. Immediately the voltage level will drop below 80% when fault occurs at PCC (Point of Common Coupling) and the rotor speed of IG (Induction Generators) becomes unstable. In this work, UPFC are used under fault condition to improve the LVRT (Low Voltage Ride-Through) of WECS (wind energy conversion system) and damping of rotor speed oscillations of IG. Furthermore, after the fault UPFC act as virtual inductor, leads to increase in terminal voltage of WECS. WECS with DFIG-based system is considered for analysis here. By simulating DFIG-based WECS with UPFC indicates the improvement in LVRT & remains and WTGs continues to operate with grid at certain voltage fluctuations, near grid. Also, indicates voltage improvement at PCC under fault conduction, and voltage is recovered easily to 1pu at PCC.

Keywords: DFIG-WECS, UPFC, Indian Electricity Grid Code, LVRT & HVRT

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COMPREHENSIVE SURVEY ON HADOOP SECURITY

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Abstract

The new emerging technologies have provided a way for large amount of data generation. Secure storage of such a huge data is of prime importance. Hadoop is a tool used to store big data, where security of it is not assured. In this paper, we have considered a survey on various approaches which helps in providing secure storage of files in Hadoop. Hadoop framework is developed for the support of processing and storage of Bigdata in a distributed computing environment. Usage of Bigdata becomes a key factor for the companies as they can increase their operating margin. Bigdata contain user sensitive information and bring forth many privacy issues. Bigdata is a larger and a more complex datasets obtained from variety of network resources. These data sets are beyond the ability of traditionally used data processing software to capture, manage and process the data within the given time frame. These massive volumes of data are used by many of the organization to tackle the problem that couldn't be done before. Since the data holds lot of valuable information these data need to be processed in short-span of time by which companies can boost their scale and generate more revenue, traditional system resources are not sufficient for processing and storing, this is where Hadoop comes into picture .The main objective of Hadoop is running of application of bigdata. Hadoop being a great tool for data processing, it was initially designed for internal use (i.e. within local cluster) without any security perimeter of organization so they were easily hack able and exposed to threats.

Keywords: Hadoop, Data security, Big Data, Authentication, Authorization

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DESCRIPTIVE DATA ANALYSIS OF REAL ESTATE USING CUBE TECHNOLOGY

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Abstract

With the progress and application of data analysis and processing expertise, the technologies such as Data Warehouse and Cube technology had become the research spot of each business area. On-Line Analytical Processing technology has applications in the areas of merchandising system, college decision support system, enterprise marketing management system, knowledge data warehouse, and to analyse the curriculum chosen by students and many more. If we consider one business domain that is real estate, it is observed that On-Line Transactional Processing technology has been applied. This paper focuses on application of On-Line Analytical Processing and specifically descriptive data analytics, to extract more information from the traditional real estate datasets.

Keywords: Cube · Descriptive Analysis · Real Estate Analysis · OLAP · Visualization

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TEMPORAL INFORMATION RETRIEVAL AND ITS APPLICATION: A SURVEY

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Abstract

With an advent of the web, a tremendous amount of information is available online. Information can be organized and explored in the time dimension. This temporal information has to be distilled out, so as to extract the temporal entities such as temporal expressions and temporal relations out of it. Temporal information processing is an ongoing field of research that deals with natural language text, temporal relations, events, or temporal queries. This paper presents a detailed analysis of the work carried out under Temporal Information Retrieval (TIR) highlighting its sub-tasks like information extraction, indexing, ranking, query processing, clustering and classification. Also, it presents the various challenges while dealing with temporal information. To the end, various application areas are elaborated such as temporal summarization, exploration and future event retrieval.

Keywords: Temporal Information, Temporal Events, Temporal Expressions, Temporal Queries.

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A SURVEY ON MULTI-RESOLUTION METHODS FOR DENOISING MEDICAL IMAGES

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Abstract

Processing of medical images is important to improve their visibility and quality to facilitate computer aided analysis and diagnosis in medical science. Such images are usually tainted by noise due to impediments in image capturing devices, unsupportive environment or during transmission over network. Multi-resolution is a profound technique for decomposing the images into multiple scales and is widely used for image analysis in detail. This paper describes various multi-resolution techniques such as Discrete Wavelet Transform, Multi-wavelet Transform and Laplacian Pyramid to reduce wide variety of noise in images. Also, an image de-noising algorithm based on multi-resolution analysis for noise reduction has been described.

Keywords: Multi-Resolution, Image De-noising, Wavelet transforms, Laplacian Pyramid, Threshold

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PERFORMANCE METRICS FOR SOFTWARE PROCESS MODELS

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Abstract

There exist a lot of models for Software Engineering. There is no single Software Engineering model that works for all kinds of development tasks. In selecting the right model for a required task, there is lack of clear mechanisms to evaluate different models. We aim to bridge that gap by providing a quantitative approach to evaluate a model. We have defined a set of formulae that evaluate the following characteristics of a model: redundancy, redundancy cost, persistence of learning and flexibility. These formulae are applied for the Waterfall model, Iterative and Incremental Model and V-model. This work provides users with a framework to quantitatively evaluate fitness of a model for a particular task and effectively compare different models on the defined characteristics.

Keywords: Performance Metrics; Software Process Models; Redundancy; Flexibility; Persistence of Learning

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PERFORMANCE ANALYSIS OF VEDIC MULTIPLIER WITH DIFFERENT SQUARE ROOT BK ADDERS

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Abstract

Multiplication is the main basic operation used by many of the Digital Signal Processor (DSP) and vector processors. DSP application repeatedly performs the operations like signal processing, filtering, processing of discrete signal data, radar signal processing etc., and use intensive Fast Fourier Transform (FFT) operations. FFT computation uses butterfly structures, where multiplication is the basic operation. DSP processors have to execute a large number of instructions per second, which in turn uses so many FFT computations and hence the multiplication operation decides the performance of DSP processor. Designing a high performance multiplier improves the overall performance of the processor. Many multiplier architectures have been proposed in the past few decades with the attractive performance, power consumption, delay, area, throughput etc., and the most acceptable multiplier among them is the Vedic multiplier. When high performance is necessary Vedic multiplier will be the best choice. Operation of Vedic multiplier is based on ancient Vedic mathematics. This earlier multiplier has been modified to improve the performance. There are 16 sutras for the multiplication operation in this method. These sutras are used to solve large range of multiplication problems in a natural way. This method of multiplication is based on Urdhva Triyagbhyam sutra, which means horizontal and cross wire technique of multiplication operation. This method uses partial product generation in parallel and eliminates the unwanted steps with zero. Urdhva Triyagbhyam sutra is an efficient sutra which enhances the execution speed of the multiplier by minimizing the delay. This work describes the overall performance of the Vedic multiplier with different high speed adders like Regular Square Root BK adder (RSR-BK-A), Modified Square-Root BK adder (MSR-BK-A) and proposed Optimized Square-Root BK adder (OSR-BK-A). The proposed designs are simulated and synthesized in Xilinx ISE 14.7 and the results are tabulated.

Keywords: Vedic Multiplier, Urdhva Triyagbhyam Sutra, Regular Square Root Brent Kung Adder (RSR-BK-A), Modified Square Root Brent Kung Adder (MSR-BK-A), Optimized Square Root Brent Kung Adder (OSR-BK-A).

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ANALYSIS OF TRAFFIC CHARACTERISTICS OF SKYPE VIDEO CALLS OVER INTERNET

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Abstract

Skype is an important application of real time systems (RTS). It uses transmission control protocol (TCP) for connection establishment and user datagram protocol (UDP) port for transfer of audio and video data. In spite of the popularity of Skype, relatively little is known about its traffic characteristics. In this paper, the sender is sending the audio visual data using UDP port at a constant bit rate (CBR). The destination receives the data and check with its buffer threshold values. The minimum and maximum threshold values are fixed based on the receiver buffer. When the sender data is higher than the threshold value, the destination ask source to reduce the flow rate by sending an explicit control packet. When the sender rate is lower than the threshold value the destination can ask the source to increase the sending rate. The introduction of feedback system using a control message overcome the congestion at the receiver and minimizes the data loss, increase optimal utilize of resources and enhances the quality of expectation. In Skype application, an ordinary node act one time as a sender and other time as a receiver. The proposed technique is to be built at both the end nodes. Important quality parameters such as packet loss due to congestion, one-way packet delay, effect of queuing delay on sender performance of feedback are analyzed using graphs and statistical data. Mathematical models are used to analyze the Skype performance. Matlab software is used to simulate the system and for model authentication.

Keywords: Skype, Audio, Video, UDP, Feedback, VoIP.

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SMART TOURIST GUIDE (TOURISTO)

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Abstract

Individuals travelling, frequently think that it's hard to seek places and find nearby amenities, and this issue even looks greater when we cannot talk the neighbourhood dialect. Additionally while travelling in groups, individuals like exploring different places and may get lost, which again wind up troublesome for their companions individuals to find different individuals from the group.

Touristo is a project about building up an android based application in the field of travel and tourism. Android is a Google developed programming language for mobiles and tablets. Additionally Firebase is a real-time database which is utilized for information stockpiling and handling. Hence using the features provided we intend to develop the application.

By examining the above issues and different others, we are taking this venture with the goal to develop such application to overcome above issues and serve clients better.

Keywords: Android, Firebase, Location-Based Services, Real-time location, GPS.

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THEFTED VEHICLE IDENTIFICATION SYSTEM AND SMART AMBULANCE SYSTEM IN VANETS

Dr. Nagaraja S R^a, Dr. Nalini N^b, Mohan B A^c ,Afroz Pasha^d

Abstract

VANETs act as crucial component of Intelligent Transportation System (ITS). VANETs are capable of providing connectionless communication between mobile nodes (vehicles) and static nodes such as RSU, BSU etc. to enhance safety and comfort of vehicles on the highways or in urban environments. There is no system in place for finding stolen vehicles and providing faster movement of ambulances on heavy traffic lanes. In this paper, we discuss about automated system for traffic management such as for finding stolen vehicles and providing faster movement of ambulances on heavy traffic lanes, we are coming up with two systems namely, Thefted Vehicle Identification System (TVIS) and Smart Ambulance System (SAS), respectively.

Keywords: Vehicular Ad-Hoc Networks (VANETs), On Board Units (OBU), Road side units (RSU), Base Stations Units (BSU), Dedicated Short Range Communication (DSRC).

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PERFORMANCE STUDY OF OPENMP AND HYBRID PROGRAMMING MODELS ON CPU-GPU CLUSTER

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Abstract

Optimizing complex code of scientific and engineering applications is a challenging area of research. There are many parallel and distributed programming frameworks which efficiently optimize the code for the performance. In this study, we did a comparison study of the performance of parallel computing models. We have used irregular graph algorithms such as Floyd's algorithm (shortest path problems) and Kruskal's algorithm (minimum spanning tree problems). We have considered OpenMP and hybrid [OpenMP+MPI] on CPU cluster and MPI+CUDA programming strategies on the GPU cluster to improve the performance on shred-distributed memory architecture by minimizing communication and computation overlap overhead between individual nodes. A single MPI process per node is used to launch small chunks of large irregular graph algorithm on various nodes on the cluster. CUDA is used to distribute the work between the different GPU cores within a cluster node. Results show that from the performance perspective GPU implementation of graph algorithms is effective than the CPU implementation. Results also show that hybrid[MPI+CUDA] parallel programming framework for Floyd's algorithm on GPU cluster yields an average speed up of 19.03 when compared to the OpenMP and a speedup of 15.96 is observed against CPU cluster with hybrid [MPI+OpenMP] frameworks. For Kruskal's algorithm average speedup of 27.26 is observed when compared against OpenMP and a speedup of 20.74 is observed against CPUs cluster with hybrid [MPI+OpenMP] frameworks.

Keywords: CPU, GPU, CUDA, MPI, OpenMP

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SIGNATURE ANALYSIS FOR FORGERY DETECTION

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Abstract

Forgery of signature has become very common and the need for identification and verification is vital in security and resource access control. There are three types of forgery: Random forgery, Simple or casual forgery, Expert or skilled or simulated forgery. The main aim of signature verification is to extract the characteristics of the signature and determine whether it is genuine or forgery. There are two types of signature verification static or offline and dynamic or online. In our proposed solution we use offline signature analysis for forgery detection which is carried out by first acquiring the signature and then using image pre-processing techniques to enhance the Image. Feature extraction algorithms are further used to extract the relevant features. These features are used as input parameters to the machine learning algorithm which analyses the signature and detects for forgery. Performance evaluation is then carried out to check the accuracy of the output.

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OPTIMAL SENSOR DEPLOYMENT AND BATTERY LIFE ENHANCEMENT STRATEGIES TO EMPLOY SMART IRRIGATION SOLUTIONS FOR INDIAN AGRICULTURAL SECTOR

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Abstract

In this fast growing technology, agriculture sector in India is one of the domains where we have observed slow adoption of Internet of Things (IoT) solutions. Unavailability, expensive seasonal labour and inadequate water resources are one of the major problems faced by Indian agriculture. Use of costly industrial standard sensors, energy utilization and placement of sensors also pose a greater problem for adoption of IoT solutions. This paper proposes an IoT based framework and a strategy for placement of optimal number of sensors and optimal utilization of battery to address the mentioned issues. Framework adopts NodeMCU and Moisture Sensor that address communication and water scarcity problems. We are using Thingspeak cloud to store and process the sensor data. Results demonstrate the effectiveness of our strategies and proposed IoT framework.

Keywords: Internet of Things (IoT), Sensors, Strategy, Power consumption/ utilization.

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SMART WASTE MONITORING USING WIRELESS SENSOR NETWORKS

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Abstract

In today's technology waste disposal and management is becoming a very big issue for the people. As it is the main cause for the unhygienic environment. This leads to various diseases and human illness. To avoid this situation we are going to implement a system with the help of python and IOT. The concept is based on smart waste monitoring system. This will help us to maintain a clean environment in our city. We can manage the waste disposal in various areas of the city. IOT is a concept in which we can operate various devices without any User intervention. We can able to manage all the devices with the help of IOT. Sitting at one place we can able to monitor our system and keep an eye over the city.

We are making use of Raspberry pi to operate raspbian OS to enable device connectivity. Different IR sensors are used to detect the level of the dustbin camera is also fixed in the area to capture the Image of the dust in the area. The information is send to the authorized person and we can take the immediate action related to that.

Keywords: python, IOT, Raspberrypi, IRsensors, Camera

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DIGITAL FILTER TECHNIQUE USED IN SIGNAL PROCESSING FOR ANALYSING OF ECG SIGNAL

Manjunath A E^a, M V Vijay Kumar^b, Swarnalatha K S^c

Abstract

The area of signal processing holds high significance in biomedical engineering, acoustics and sonar fields. The main finding of coronary heart illnesses is done utilizing ECG. It demonstrates the bio physiology of cardiac muscles and modifications like arrhythmia and also conduction surrenders. ECG in flag handling is a prime zone of study in Bio-Signal Processing. Present day advancements in personal computer equipments and computerized channel approach in flag preparing has made correspondence with personal computers through ECG signals suitable. Efficient determination of ECG is a mechanical test. This study exhibits a far reaching review of computerized sifting strategies to adapt to the clamour curios in ECG flag. The goal of this paper is to separate noteworthy components of ECG utilizing signal preparing methods. Methodologies of different computerized channel for ECG in flag preparing are analyzed. Noteworthiness of flag preparing gives off an impression of being with no noticeable indication of immersion in today's world.

Keywords: Finite Impulse Response (FIR), Infinite Impulse Response (IIR), Signal Processing, Low Frequency Filtering, High Frequency Filtering.

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GEO-FENCING BASED ACCIDENT AVOIDANCE NOTIFICATION FOR ROAD SAFETY

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Disha D. N^a, Swarnalatha K S^a

Abstract

The aim of the project is to attempt the reduction of occurrence of accidents by providing effective and precautionary notifications to the user on the progressive web app, if the user is approaching the accident-prone zone. In the past, due to road accidents, over ten lakh people had been killed and 50 lakhs had been severely injured, in India. The project provides notifications about approaching vehicles in and around accident-prone areas. Notifications are voice-based so that user could focus on driving and need not constantly view the phone for the precautionary warnings. The project uses GPS (Global Positioning System) to specify a virtual boundary called the geofence, and open source Google APIs for setting the accident-prone areas on Google Maps. Firebase is used as a backend to store the data on real time databases for providing a warning on approaching vehicles. The geofenced areas are marked at a sufficient distance from the actual accident-prone zones so as to provide notifications in advance. Necessary notifications are provided on the app, only if the user is in the geofenced area. The prototype also demonstrates temporary geofencing, to provide warnings about the conditions like a roadblock.

Keywords: Geo-fencing, Accident prone, GPS, 000Webhost

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AN INNOVATIVE IOT AND MIDDLEWARE BASED ARCHITECTURE FOR REAL TIME PATIENT HEALTH MONITORING

Mohan B A^a, Dr. Sarojadevi H^b

Abstract

WSN is deployed in every sector of human life, an instance of which is in medical device network. With the increasing requirement of handling large patient data and faster data conversion in the hospital and medical diagnostic centers, there is a need for innovative and low cost ways of interconnecting medical equipment, middleware and network support. Hospitals and Medical diagnostic centers require cost effective sensor network for handling large patient data and fast conversion. The high cost of medical devices, equipment and lack of interoperability and portability necessitates new approaches. This paper presents low cost and portable approach for medical data transmission from devices to middleware using IoT support and conversion to universal standard called Health Level-7 (HL7) and a method to store in cloud.

Keywords: Medical Health Record, Health Monitoring System, IoT, Middleware, Health Level-7.

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TRAVELLING SALESMAN PROBLEM: AN EMPIRICAL COMPARISON BETWEEN ACO, PSO, ABC, FA AND GA

Kinjal Chaudhari^a and Ankit Thakkar^b

Abstract.

Travelling salesman problem (TSP) is one of the optimization problems which has been studied with a large number of heuristic and metaheuristic algorithms, wherein swarm and evolutionary algorithms have provided effective solutions to TSP even with a large number of cities. In this paper, our objective is to solve some of the benchmark TSPs using ant colony optimization (ACO), particle swarm optimization (PSO), artificial bee colony (ABC), grey algorithm (FA) and genetic algorithm (GA). The empirical comparisons of the experimental outcomes show that ACO and GA outperform to ABC, PSO and FA for the given TSP.

Keywords: TSP, ACO, PSO, ABC, FA, GA

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TWITTER DATA SENTIMENT ANALYSIS ON A MALAYALAM DATASET USING RULE BASED APPROACH

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Abstract

Opinion characterization is nowadays a potential and intense research focus because of the hasty growth of social media such as blogs, social networking sites, where individuals put in freely their perspectives on different themes. Researches prove that people find it comfortable to opine in their mother tongue, be it verbal or written. Given that now almost all social platforms support most of the popular languages, the requirement to mine the sentiments in various dialects is on the rise. However, not all data may be relevant; some may not have any impact on the end result and some may have similar meanings. A preprocessing phase is hence required to help make the dataset concise. In this paper, the authors focus on finding out the polarity of the words input by various users through their reviews exhibited using the South Indian language, Malayalam. Malayalam like the other languages in the Dravidian family exhibits the characteristics of an agglutinative language. The preprocessing process consists of cleaning the data, tokenization, stop-word removal etc. In this paper, authors are focusing on the document based polarity calculation of the Malayalam reviews. The overall polarity of the corpus is calculated based on the positivity and negativity values of individual documents. It is found that negativity value is higher for the user reviews in our corpus which shows their negative attitude towards the news thread with the classifier accuracy of 89.33%.

Keywords: Opinion Mining, Sentiment Analysis, Stopword Removal, Malayalam, Lexicon based, Naïve Bayes, Machine Learning

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AN IOT BASED SMART WATER MIRCOGRID AND SMART WATER TANK MANAGEMENT SYSTEM

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Abstract

Water is most important resource which needs to be managed smartly. Managing house water supply in a society consisting of water tanks, motors and pumps, automatically is an important task for efficient consumption of water. In this paper we propose a smart solution for leakage detection in the tank using its dimensions and sensor data. The data from each house, is stored on the cloud for analyzing the water consumption of each house in a society and main water supply, through GSM/GPRS 900a module. A hybrid application, Smart Water Grid, is responsible for monitoring the water level in the tank continuously, to control the motor automatically and it consists of an inspection mode to detect the leakage in the tank and its dimension.

Keywords: GSM SIM 900a, Arduino, ThingSpeak cloud, leakage detection and dimension, hybrid application.

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SMART SENSING FOR VEHICULAR APPROACH

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Abstract

Every day around the world, a humongous amount of people die from road accident and the subsequent injuries. There are many problems which is largely prevalent in the everyday life of a driver around the globe. Some of the techniques that are available in the market are too expensive to implement on a common vehicle. If we take a look around the common household in an Indian society, most of the people are using average cost vehicles and they are not able to afford the existing techniques which can detect the obstacle to prevent from the road accident. The survey has been conducted on the problems which are being faced by the driver at the time of driving and we have proposed a suitable and less expensive ways to implement the solutions of, not all the problems, but few of them to detect the causes of road accident by using some sensors like ultrasonic sensor, ldr sensor, ir sensor, etc. and prevention from collision. As smart–driver assistance system, invisibility problem is our main focus in this project.

The concept is that it assists the driver with information and actions. In our proposed work, the smart-driver assistant system will provide the information after analyzing results of various sensors existing in the system and then if the driver is unable with actions necessary to ensure the driver's safety. Invisibility in fog is one of the major reasons of road accidents, various approaches have been made to counter this problem. We have found that ultrasonic sensor can be used to counter this problem. The sensed information is provided to the driver who takes appropriate action depending on the information. However, there are cases where the driver is incapacitated or unable or there are cases where the driver actually needs to drive faster for some urgency. In such cases, the smart-driver assistant system comes in play and slows down the vehicle for the drive, which changes their direction. If unable, the system slows the vehicle itself and if still not stopped, it stops the vehicle at 20 cm away from the obstacle. The proposed work has been tested with four parameters and found to be a better solution.

Keywords: Smart-Driver Assistance System, LDR, IR, Ultrasonic Sensor.

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ANDROID MALWARE DETECTION TECHNIQUES

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Abstract

Importance of personal data has increased along with the evolution of technology. To steal and misuse this data, malicious programs and software are written to exploit the vulnerabilities of the current system. These programs are referred to as malware. Malware harass the users until their intentions are fulfilled. Earlier malware were major threats to the Personal Computers. However, now there is a lateral shift in interest towards Android Operating System, which has a large market share in smartphones. Day by day, malware are getting stronger and new type of malware are being written so that they are undetected by the present software. Security parameters must be changed to cope up with the changes happening around the world. In this paper we discuss, the different types of malware analysis techniques which are proposed till date to detect the malware in Android platform. Moreover, it also analyses and concludes about the suitable techniques applicable to the different type of malware.

Keywords: Android Malware, Static Analysis, Hybrid Analysis, Detection Techniques, Dynamic Analysis.

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A COMPARATIVE STUDY OF MACHINE LEARNING TECHNIQUES FOR EMOTION RECOGNITION

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Abstract

Humans share emotions which they exhibit through facial expressions. Automatic human emotion recognition algorithm in images and videos aims at detection, extraction, and evaluation of these facial expressions. This paper provides a comparison between various multi class prediction algorithms employed on the Cohn Kanade dataset. The different machine learning algorithms can be used to provide emotion recognition task. We have compared the performance of K-Nearest Neighbors, Support Vector Machine and neural network.

Keywords: Emotion Recognition, Machine Learning, Cross Validation, Performance Analysis

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IOT BASED SMART PARKING SYSTEM

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Abstract

Post liberalization, Indian cities are growing at an exponential growth rate. The rapid growth of the towns is giving birth to many socio-economic problems. With the increase in the number of personal vehicles and shrinking parking spaces, the problem of parking vehicles at wrong parking spaces are steadily increasing which causes home and business establishment owners a lot of discontents, time wastage, and unnecessary chaos. By adopting latest technologies, the parking issue can be addressed more smartly. In this work, we have designed, developed, and tested an IOT based smart parking solution. We have conducted rigorous testing of our solution in real life under various circumstances and observe that our approach provides a practical solution to the wrong parking issue.

Keywords: IOT, Smart Parking, Raspberry Pi

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SMART AGRICULTURAL MONITORING SYSTEM USING INTERNET OF THINGS

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Abstract

India is one of the largest agricultural country with a population of 1.3 billion. Farming in India is labour intensive and absolute. 70% of India's residents are dependent on farming and one-third of Nations funds come from agriculture. Even after decades of cultivation practise it is lagging behind in maximising the yield thereby hampering the progress of the nation. In order to overcome this, there is a need for promoting cultivation practise for high yield of crops. With the availability of IT and internet, Internet of Things is proliferating at an unprecedented rate. The perception of agricultural IoT(Internet of things)utilises networking equipment in farming construction. The hardware part of this project includes processors with data processing capability and sensors which are used to measure various parameters like temperature, humidity, and water level. In this paper the sensor node is designed to monitor the environmental conditions that are vital for the proper growth of crops. The collected data received is analysed for proper monitoring and improving the yield of the crop. The result depicts the data being stored and retrieved on Agricloud[10]

Keywords: IoT, Sensors, Agricloud, Smart Agriculture

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DETECTING HEALTHINESS OF LEAVES USING TEXTURE FEATURES

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Abstract

Agriculture is the dominant sector of our economy and contributes in various ways but the yield in the productivity leads to significant reduction in the farmer's income. Monitoring crop health is important to increase the quality and quantity of the yield. But this requires manually monitoring the crops and also expertise in the field. Hence automatic disease detection using Image texture features is used for ease and to detect the disease at an early stage. The proposed methodology for the project is to design and implement the algorithm on two sets of databases. Firstly a locally generated leaf database which contains images of leaves. Secondly on a standard database which is a common test database. The basic steps for crop disease detection include Image Acquisition, Image Pre-processing, Image Segmentation, Feature Extraction and Classification using Image Processing Techniques. The acquired leaf images are pre-processed by removing undesired distortion, noise and then the processed image is further subjected to K-Means based segmentation. The segmented image is further analyzed using HAAR wavelet transform, GLCM based on its texture by extracting feature vector. SVM is used for classification of image. Thus the presence of diseases in leaf is identified along with all the features values of the leaf. It also calculates the accuracy rate of the prediction made by the system.

Keywords : Image processing, Gray level co-occurrence matrix, Support Vector Machine-Nearest Neighbour, Haar Wavelet, K-means

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A SURVEY ON DIERENT NETWORK INTRUSION DETECTION SYSTEMS AND COUNTER MEASURE

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Abstract

Recent studies have pulled tons of research in the domain of cloud security and various Intrusion Detection Systems (IDSs). This is because of advancement in the dierent types of attacks on computer systems. Distributed Denial of Service (DDoS) attack is one of them wherein the attackers can compromise the cloud system by exploiting vulnerabilities. Initially, during the multi-step exploration, vulnerability with low frequency along with the virtual machine which is identified and compromised are included in DDoS attacks. In this context, various IDSs have been surveyed with dierent countermeasure techniques including some eective techniques to minimize the malicious activities within end systems or networks. The main aim of IDSs is to detect dierent attacks within networks and end systems or to be precise against any information systems which are very dicult to maintain in a secure state for a long duration. Some studies have shown that the use of host-based systems and the network-based systems help to improve the attack detection. This paper focuses on the study of various well-known IDS and various techniques to minimize malicious activities within the system.

Keywords: Graph model, Zombie detection, Network security, Cloud computing, Intrusion detection systems, DDoS attacks, Cloud security, Survey

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COMPRESSED SENSING FOR IMAGE COMPRESSION: SURVEY OF ALGORITHMS

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Abstract

Compressed sensing (CS) is an image acquisition method, where only few random measurements are taken instead of taking all the necessary samples as suggested by Nyquist sampling theorem. It is one of the most active research areas in the past decade. In this age of digital revolution, where we are dealing with humongous amount of digital data, exploring the concepts of compressed sensing and its applications in the field of image processing is very much relevant and necessary. The paper discusses the basic concepts of compressed sensing and advantages of incorporating CS based algorithms in image compression. The paper also discusses the drawbacks of CS and conclusion has been made regarding when the CS based algorithms are effective and appropriate in image compression applications. As an example, reconstruction of an image acquired in compressed sensing way using l_1 minimization, total variation based augmented Lagrangian method and Bregman method is presented.

Keywords: Compressed sensing, Image compression, Nyquist Sampling Theorem.

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INTRUSION DETECTION SYSTEM USING RANDOM FOREST ON THE NSL- KDD DATASET

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Abstract

In the modern world of inter-connected systems, network security is gaining importance and attracting a lot of new research and study. Intrusion Detection Systems (IDS) form an integral part of network security. To enhance the security of a network, machine learning algorithms can be applied to detect and prevent network attacks. Taking advantage of the robust NSL-KDD dataset, we have employed the supervised learning algorithm Random Forests to train a model to detect various networking attacks. To further increase the classification accuracy of our model, we have employed the use of famous data mining technique of feature selection. Smart feature selection using Gini importances has been employed to reduce the number of features. Experimental results have shown that our model not only runs faster but also performs with a higher accuracy.

Keywords: NSL-KDD, Machine Learning, Random Forest, Classification, Computer Networks, Cybersecurity.

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DUAL MODE WIDE BAND MICROSTRIP BANDPASS FILTER WITH TUNABLE BANDWIDTH AND CONTROLLED CENTER FREQUENCY FOR C BAND APPLICATIONS

Shobha I Hugar^a , Dr Vaishali Mungurwadi^b, Dr J S Baligar^c

Abstract

This paper presents a unique approach for designing dual mode wide band BPF with tunable bandwidth and controlled center frequency for C Band (4GHz-8GHz) applications. The proposed filter is designed using Radial stub loaded dual mode $\lambda_g/2$ resonator to get wide passband. The dual mode behaviour of the resonator i.e odd and even mode resonance frequencies are realized by inserting an radial stub at the center of the resonator and further the size of filter is reduced by folding the resonator. A modified feed structure which embraces the two arms of the resonator is used to obtain two transmission zeros in upper stop band. By keeping all calculated dimensions of filter fixed and by varying only radial angle θ (in degrees) of radial line stub, FBW is tuned while controlling center frequency. From simulation results, it is observed that the designed filter has very good pass band characteristics, a wide 3 dB pass band from 4.4GHz - 7.8GHz with center frequency at 6GHz, fractional bandwidth of 56.6%, return loss S_{11} more than 13dB and transmission loss S_{21} better than 0.3dB respectively.

Keywords: SIR-Stepped Impedance Resonator, BPF-Bandpass Filter, FBW-Fractional Bandwidth.

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ADHYAYAN - AN INNOVATIVE INTEREST FINDER AND CAREER GUIDANCE APPLICATION

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Abstract

ADHYAYAN is an innovative mobile application which determines a user's interest in a particular domain and nurtures them effectively so that they can pursue career in the field which they are interested in. The system takes into account social media posts, results of a test and application activity to find out the interest of users in different fields and then assists, guides and evaluates them continuously to improve their skills in these fields. ADHYAYAN is a three tier system which consists of a Front-end, Middle Layer and Back-end. Front-end is an Android application which provides personalized GUI for each user. Middle Layer is Firebase while Back-end is a Server hosted on 'Google Cloud Platform'. An Algorithm has been developed for ADHYAYAN which calculates the ratio of user's interest in different domains and eventually feeds are generated in the same ratio on user's profile. To cater the increasing need of skilled employees in different fields and promote interest based learning, ADHYAYAN has been proposed to overcome various limitations and drawbacks of existing solutions.

Keywords: Unemployability · Social Media · Continuous Evaluation · Test · Feeds · Profile · Skills · Career · Short Term Profile · Long term Profile · Personalized · Real-time

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IMPLEMENTATION OF CURE CLUSTERING ALGORITHM FOR VIDEO SUMMARIZATION AND HEALTHCARE APPLICATIONS IN BIG DATA

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Abstract

The Data mining techniques provide useful ways to generate desired patterns from the large data and establish relations between them to solve problems using data analysis. This paper focuses on a data mining algorithm called CURE, and its applications on healthcare and video data. Big data consists of large-volume, ever growing data sets with multiple sources. Big Data in healthcare is an emerging area which helps healthcare organisations for their analytics and reporting needs. Data mining techniques, predictive analytics, and prescriptive analytics are some of the methods to analyse the healthcare data and derive useful information for several applications. On the other hand, video processing is an emerging area of research which gives rise to variety of applications like object tracking, shot detection, video summarization etc. This paper discusses the application of CURE clustering algorithm on video processing for generating Video Summary and application of the same algorithm on Big Data Healthcare dataset for deriving disease related information.

Keywords: Big Data Analytics, Video Processing, Data Mining Techniques, Healthcare, CURE, Video Summarization

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REDUNDANCY MANAGEMENT OF ON-BOARD COMPUTER IN NANOSATELLITES

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Abstract

Satellite bus has subsystems like Attitude Determination and Control System (ADCS), Electrical Power System (EPS), Communication, Command & Data Handling (C&DH) for operations at different phases of the mission. These subsystems requirements are processed and controlled by the onboard computer (OBC) subsystem in the satellite. On-Board Computer (OBC) subsystem plays a vital role in the functioning of the satellite system, a small malfunction in this system might result in the entire mission failure. For such critical subsystem where onboard manual intervention to repair or replace a failed component is difficult, it is very much essential to have a redundant mechanism. Using redundancy concepts to improve the reliability of systems or subsystems is a well-known principle. This paper describes the architecture of OBC and the redundancy configuration in the nanosatellite. Further, the redundancy management between Master and Redundant subsystem is explained. This is achieved by first detecting the failure by using an external watchdog timer that monitors master OBC unit along with the redundant. The isolation of the fault signals from the failed unit is controlled by the power control switch.

Keywords: OBC (On-Board Computer), ARM (Advanced RISC Machine), MCU (Master Control Unit), RCC (Reset and Clock Control), USART (Universal Synchronous Asynchronous Receiver Transmitter), GPIO (General Purpose Input Output), CAN (Controller Area Network), C&DH (Command and Data Handling), ADCS (Attitude Determination Control System), IPC (Inter-Process Communication)

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A FAULT TOLERANT ARCHITECTURE FOR SOFTWARE-DEFINED NETWORK

Bini Y Baby^a, Karunakara Rai B^b, Karthik N^c, Akshith Chandra^d, Dheeraj R^e, RaviShankar S^f

Abstract

Software defined networks is a single point control architecture where the control plane and data plane are disaggregated. It has a centralized controller, switches and hosts. Here the OVS switches which acts as the data forwarding plane are connected to the controller having forwarding details. In the above said architecture if the controller goes down due to bottleneck problems that arises because of packet injection or any other attacks then the network experiences performance drawbacks. Hence in this paper we propose a fault tolerant approach for software defined networks. Once the controller fails, OVS switches are made as controllers by using a switch type by name “UserspaceSwitch in Namespace” which separates switches namespace from the controller. We have used Mininet an emulator for simulation of software defined networks with POX, a remote controller. The proposed fault tolerant approach for software defined networks is also simulated using the mentioned software’s. The hosts are made as client and server, the data traffic is generated between them using UDP which gives different parameters as output for analyzing the performance. Further, graphs are plotted considering three parameters delay, packet loss and throughput for both SDN with centralized control and fault tolerant approach to analyze performance.

Keywords: Software defined networking; network bottleneck; SDN controller; DHT-switch

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OPTIMAL THRESHOLDING IN DIRECT BINARY SEARCH VISUAL CRYPTOGRAPHY FOR ENHANCED BANK LOCKER SYSTEM

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Abstract

Visual cryptography (VC) is one of the strongest cryptographic methods present. The main advantage of this system is that the decryption doesn't need any specific requirements for decoding other than human eyes. Using halftoning techniques binary images are obtained for grayscale and color images, this technique is applied in Halftone VC. In this paper direct binary search (DBS) is implemented and initial images are modified for better quality of recovered images. The concept is proposed for bank locker systems. Comparison has been made using parameters like PSNR, Correlation, UQI and SSIM.

Keywords: Visual Cryptography, Halftone Visual Cryptography, Direct Binary Search, Color images, Bank Lockers, Security.

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COMPARISON BETWEEN THE DDFS IMPLEMENTATION USING THE LOOK-UP TABLE METHOD AND THE CORDIC METHOD

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Abstract

An efficient communication system requires a synchronization between the transmitter and the receiver, which is achieved by generating the same local carrier frequency. Direct Digital Frequency Synthesizer (DDFS) is one of the methods to generate various frequencies, centered around a reference frequency. This paper presents the comparison between the DDFS implementation using the Look-Up Table (LUT) method and the CORDIC, a multiplier less Algorithm. The implementation has been carried out in Simulink and various parameters have been analyzed.

Keywords - DDFS, LUT, CORDIC

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ADDING INTELLIGENCE TO A CAR

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Shilpa Mondal^d, Asst. Prof Raji P^e

Abstract

The automobile business has been globalized from its initial days. Carmakers and innovation firms are investigating every possibility in their joint endeavors to upgrade the execution of keen automobile stages. Mischances are expanding everywhere pace and different advancements are being utilized to diminish it. Utilizing generally straightforward programming and changes in accordance with existing equipment we can accomplish an exceedingly secure automobile. This venture builds up a framework that the majority of its activities are controlled by smart programming inside the ARM LPC 2148. It expects to plan and build up a framework which can be controlled from the outside world utilizing Bluetooth and furthermore guarantees the driver wellbeing by utilizing a contrasting option to air bags with the assistance of rack and pinion framework. At the point when the automobile is being utilized by any unapproved individual, a message containing the automobile area with the assistance of GPS and GSM will achieve the proprietor quickly. The proprietor derives about the security rupture and tries to control and stop the automobile with Bluetooth. Adding to this, when the temperature of the motor is raised past a specific point of confinement, the automobile is made to stop naturally until the point that the temperature is under control.

Keywords-ARM LPC 2148, Bluetooth HC-05, Rack and pinion system, Global positioning system (GPS), Global system of mobile communication (GSM), Temperature sensor LM35.

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THERMAL CARE AND SALINE LEVEL MONITORING SYSTEM FOR NEONATAL USING IOT

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Abstract

A newborn baby usually have problem to adapt the change in temperature, be it a full term healthy baby or a preterm baby or low-birth weight babies. Neonatal usually have little body fat and they are too immature in handling and regulating the body temperature. A temperature ranging between 37.5 degree to 36.5 degree is considered to be normal body temperature according to the WHO, any newborn whose temperature is below the normal range and drops below 32 degree is considered as a risk leading to hypothermia condition in the new born. In such conditions babies are kept in incubators so that the babies can regulate their body temperature and get adjusted to the environment. Hypothermia in neonates is associated with increased mortality rate. Thermal management of babies is a vital and critical part of Neonatal care. And frequent check on the level of saline status is a must when given to any neonatal which cannot be neglected or show inattentiveness which may lead to life risking condition.

With the advancement of technology and IOT in the boom, this paper provides the health monitoring system of neonatal care using the IoT, A system which can monitor and maintain the necessary temperature of the neonates and monitoring of the saline bottle from a distant place.

Keywords: Neonates, Incubators, Saline, Internet of Things(IoT), IRSensors, Arduino Micro-controller.

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HOME SECURITY SYSTEM USING GSM

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Abstract

In areas where robbery and theft are a major issue, home security becomes a matter of prime importance to the residents of that area. Everyone in the locality is forced to take security measures to prevent their precious belongings from being stolen. It is therefore inevitable that a technological solution has to be formulated to ensure the safety of the house. Hence, a security device has been designed to send an alert message to the owner of the house and to the security forces nearby in an attempt to void the theft taking place. The system is designed by interfacing sensor modules with a microcontroller to detect the motion in the house and a GSM module to send alert message to the owner of the house when the house is locked. This system uses low cost sensors for motion detection and proves to be affordable. The installation of the system is easy and also the sensors and modules require very less space and consume low power when installed.

Keywords: GSM, PIR, Arduino, SMS, IDE, Ultrasonic.

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AUTOMATIC TOLL TAX COLLECTION USING GSM

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Abstract

This paper proposes a very novel approach to implement the automatic toll tax collection system on the toll plazas using Radio Frequency Identification (RFID) and Global System for Mobile (GSM). Nowadays, the cities and highways are bursting with traffic and very often long queues of vehicles can be seen at various toll plazas so that they can pay the toll and then able to use the road or highway. So a system is proposed wherein the toll tax could be paid via cashless transactions and people wouldn't have to wait for long for the cash payment of the toll tax. This would save people's money and time simultaneously. It would also eliminate errors in cash transactions and further ease the job of the toll plaza companies. It would definitely bring down any of the corruptions occurring at the toll plazas. Finally, it would make the existing toll tax collection more efficient and ease our lives a bit more.

Keywords: Arduino; RFID; GSM; tags; motor driver.

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FACIAL EXPRESSION RECOGNITION BY CONSIDERING NONUNIFORM LOCAL BINARY PATTERNS

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Abstract

Recognizing a face with an expression has paying attention due to its well-known applications in a broad range of fields like data driven animation, human machine interaction, robotics, driver fatigue detection, etc. People can vary significantly their facial expression, hence facial expressions recognition is not an easy problem. This paper presents a significant contribution for facial expressions recognition by deriving a new set of stable transitions of Local Binary Pattern by selecting the Significant Non Uniform Local Binary Patterns. The proposed patterns are stable, because the transitions from two or more consecutive ones to two or more consecutive zeros. For better recognition rate the new set of patterns are combined with uniform patterns of local binary pattern. A distance function is used on proposed texture features for effective facial expression recognition. Preprocessing method is also used to get rid of the effects of illumination changes in facial expression by preserving the significant appearance details that are needed for facial expression recognition. The investigational analysis was done on the popular JAFFE facial expression database and has shown good performance.

Index Terms: face, expression, pattern, local binary pattern, illumination, preprocessing, distance function, and stable transition.

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