



INTERNATIONAL CONFERENCE ON
**ROBOTICS DESIGN AND APPLICATIONS
USING WIRELESS SENSOR NETWORKS,
IOT AND ARTIFICIAL INTELLIGENCE**

26TH , 27TH & 28TH NOVEMBER 2020



Virtual Conference

Organized By

G Narayanamma Institute of Technology & Science (Autonomous),
Hyderabad, Telangana

in Association with

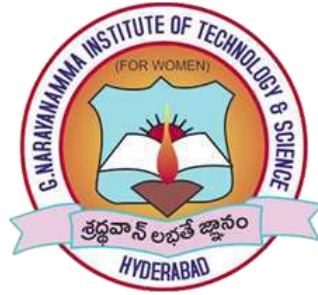
Institute For Engineering Research and Publication (IFERP)



International Conference on Robotics Design and
Applications using Wireless Sensor Networks,
IoT and Artificial Intelligence

ICRDASIA-2020
Virtual Conference

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IFERP-Explore

Editorial

We cordially invite you to attend the **International Conference on Robotics Design and Applications using Wireless Sensor Networks, IoT and Artificial Intelligence (ICRDASIA-2020)** which will be held on **26th, 27th & 28th November, 2020** - Virtual conference. The main objective of **ICRDASIA-2020** is to provide a platform for Researchers, Students, Academicians as well as Industrial Professionals from all over the world to present their research results and development activities in relevant fields of Science, Engineering and Technology. This conference will provide opportunities for the delegates to exchange new ideas and experience face to face, to establish business or research relationship and to find global partners for future collaboration.

These proceedings collect the up-to-date, comprehensive and worldwide state-of-art knowledge on cutting edge development of academia as well as industries. All accepted papers were subjected to strict peer-reviewing by a panel of expert referees. The papers have been selected for these proceedings because of their quality and the relevance to the conference. We hope these proceedings will not only provide the readers a broad overview of the latest research results but also will provide the readers a valuable summary and reference in these fields.

The conference is supported by many universities, research institutes and colleges. Many professors played an important role in the successful holding of the conference, so we would like to take this opportunity to express our sincere gratitude and highest respects to them. They have worked very hard in reviewing papers and making valuable suggestions for the authors to improve their work. We also would like to express our gratitude to the external reviewers, for providing extra help in there view process, and to the authors for contributing their research result to the conference.

Since September 2020, the Organizing Committees have received more than 140 manuscript papers, and the papers cover all the aspects in Electronics, Computer Science, Information Technology, Science Engineering and Technology. Finally, after review, about 53 papers were included to the proceedings of **ICRDASIA-2020**.

We would like to extend our appreciation to all participants in the conference for their great contribution to the success of **ICRDASIA-2020**. We would like to thank the keynote and individual speakers and all participating authors for their hard work and time. We also sincerely appreciate the work by the technical program committee and all reviewers, whose contributions made this conference possible. We would like to extend our thanks to all the referees for their constructive comments on all papers; especially, we would like to thank to organizing committee for their hard work.

Acknowledgement

IFERP is hosting the **International Conference on Robotics Design and Applications using Wireless Sensor Networks, IoT and Artificial Intelligence** this year in month of November. The main objective of ICRDASIA-2020 is to grant the amazing opportunity to learn about groundbreaking developments in modern industry, talk through difficult workplace scenarios with peers who experience the same pain points, and experience enormous growth and development as a professional. There will be no shortage of continuous networking opportunities and informational sessions. The sessions serve as an excellent opportunity to soak up information from widely respected experts. Connecting with fellow professionals and sharing the success stories of your firm is an excellent way to build relations and become known as a thought leader.

I express my hearty gratitude to all my Colleagues, staffs, Professors, reviewers and members of organizing committee for their hearty and dedicated support to make this conference successful. I am also thankful to all our delegates for their pain staking effort to make this conference successful.



Er. R. B. Satpathy
CEO (Chief Executive Officer)
Institute for Engineering Research and Publication (IFERP)

Message from Chairman



Sri.P.Subba Reddy

Hon'ble Chairman,
GNITS, Hyderabad,
Telangana, India.

Message

On I am honored to welcome all the delegates to the AICTE sponsored virtual **International Conference on Robotics Design and Applications using Wireless Sensor Networks, IoT, and Artificial Intelligence ICRDASIA-2020**. Over the past two decades G. Narayanamma Institute of Technology and Science (GNITS) has evolved to be a best destination for the finest quality education with its state of art infrastructure and excellent human resources for engineering education.

GNITS takes keen interest in updating its infrastructure that stimulates intellectual thinking and academic interaction to meet the technological revolution and new challenges of modern era. In GNITS students are given support and encouragement to take up the internships and training programmes offered by the companies and project works in collaboration with the expertise provided by the corporate and industries.

The aim of the conference is to provide a common platform to researchers, industry personal, academicians and participating professionals to interact and discuss about the advances made in the areas of Robotics, Wireless Sensor Networks ,IoT ,Artificial Intelligence & Machine learning. Scientific advancements must yield benefits for the peaceful coexistence, progress, prosperity and welfare of people everywhere. This type of conference not only brings all the researchers and students at one platform, but it also inculcates the research culture among the entire fraternity of education, there by contributing to the development of society. I hope that through this conference, the participants will have a fruitful discussion and come out with innovative ideas to bring advances in the field of Robotics, Wireless Sensor Networks, IoT, and Artificial Intelligence & Machine learning under the aegis of GNITS.

Best wishes

P. Subba Reddy

Message from Secretary



Smt.G.Srividya Reddy

Secretary,
GNITS, Hyderabad,
Telangana, India

Message

I am extremely delighted to welcome all the delegates to the an AICTE sponsored virtual **International Conference on Robotics Design and Applications using Wireless sensor Networks, IoT, and Artificial Intelligence ICRDASIA-2020** at G. Narayanamma institute of technology (GNITS). This conference aims to highlight the recent research outcomes in the field of Robotics, Wireless Sensor Networks, IoT, Artificial Intelligence & Machine learning.

The rapid rate of technological advancements and information revolution has opened new series of challenges as well as opportunities. Today, the society, the academia & the industry need to stand together and share their commitment, enthusiasm, and expertise in order to create a responsible, progressive and skilled citizenry. GNITS has thrived and advanced in the field of Women empowerment through engineering education and has carved a name for itself. Utilization of the talents of women should not be viewed only from the perspective of gender equality. It must be understood that full involvement of women in scientific and technological efforts is today essential for rapid economic development and sustainable happiness.

It is my great pleasure to wish all the delegates for considerable achievements in their pursuits in respective fields. Collectively all our efforts should make the society to progress with prosperity and peace for everyone. I have great confidence in stating that, this conference will certainly be a step towards that objective.

In this connection I convey my best wishes to the organizing committee for their laudable effort and also wish them grand success in conducting event.

Wish best wishes

Smt.G. Srividya Reddy

Message from Principal



Dr.K.Ramesh Reddy

Principal,
GNITS, Hyderabad,
Telangana, India

Message

On behalf of organizing committee, it is my great privilege to welcome you to the an AICTE sponsored virtual **International Conference on Robotics Design and Applications using Wireless Sensor Networks, IoT, and Artificial Intelligence ICRDASIA-2020** at G. Narayanamma Institute of Technology & Science GNITS (Autonomous). The aim of **ICRDASIA-2020** is to bring together Researchers, scientists, Engineers, Scholars and students in the areas of computing, communication and electrical engineering to exchange ideas and presenting their research works. In addition it is a venue for interaction and to establish all important contacts with each other. **ICRDASIA-2020** is a multi-disciplinary peer reviewed international conference on computing, communication and electrical engineering that provides a forum for exchange of latest technological information. We all understand the need to rejuvenate ourselves to further expand our frontiers in facilitating quality education for research community, particularly growing young generation to enhance technical understanding of current scenario.

The various thematic sessions will showcase important technological advances and highlight their significance and challenges in a world of fast changes. I hope the participants of the conference will have a great experience while attending the plenary sessions and online presentations and will get an opportunity to interact with the conference participants. This conference will definitely enrich your innovative and research ideas.

I congratulate all the participants for having their research articles presented at **ICRDASIA-2020** and sharing a most pleasant, interesting and fruitful conference.

With best wishes

Dr.K.Ramesh Reddy

Message from Coordinator



Dr. Meeniga Vijaya Lakshmi

Associate Professor, ECE,
GNITS, Hyderabad,
Telangana, India.

Message

On behalf of the Conference board I would like to welcome all the participants, research scholars and faculty members of various Engineering Colleges to AICTE sponsored virtual conference ICRDASIA-2020. The overwhelming response to ICRDASIA-2020 indicates the importance of this conference and confirms that ICRDASIA-2020 will become the good platform for discussing latest technological trends and development of “Probing Innovations-Opportunities in Robotics and its allied technologies like Artificial Intelligence, IOT, Sensor networks”. There are many challenges associated with various segments of communication technologies, security issues in networks, cost minimization issues in high performance computing, energy minimization issues in IoT etc. The ICRDASIA-2020 will facilitate the young researchers, industries and research organizations especially those who are carrying out their research work in the aforesaid domain of Robotics, Wireless Sensor Networks, IoT, and Artificial Intelligence & Machine learning with valuable discussions in order to make the outcomes more realistic. The conference theme will focus on captivating new ideas, self- innovation and acquiring knowledge from experts of different fields.

The main objective of ICRDASIA-2020 is to provide make a platform to conduct demonstrations, distribute information and make a splash with latest research innovations. It creates best opportunity to reach the largest assemblage of participants from the scientific community with members from around the country focused on learning about Robotics and Artificial Intelligence and to discuss emerging issues in Robotic science and Automation. This conference also aimed to disseminate the diverse voices of breakthrough innovators with visionary and practical solutions.

This prestigious conference is organized by G. Narayanamma Institute of Technology & Science (For Women) (Autonomous) in association with IFERP. The conference itself starts with keynote speeches scheduled in during session1 on 26th and session1 on 27th November 2020 will be delivered by distinguished experts. I am happy to say that the outcome of this two day Conference is brought out in the form of proceedings. I would like to express my thanks to the Convenor of the Conference Dr.B.Venkateshulu, Professor & HOD of ECE, GNITS, Hyderabad, Telangana and in association with Institute For Engineering Research and Publication (IFERP) for their outstanding support and association with expert as members and the competent evaluation of the large number of submissions. All selected papers received by the deadline have been included in the conference proceedings and best quality papers will be published in Scopus Indexed Journals. Key note lectures by experts in various fields will inspire the researchers and provide an exposure to various aspects and an opportunity for discussions with distinguished experts. On behalf of organizing team, I am thankful to our Management, Principal and other college level committee members for their extensive support and guidance to organize ICRDASIA-2020 successfully. I am very much thankful to AICTE authorities for sponsoring to conduct the conference at our institution GNITS, Hyderabad. I wish all the participants to have a successful and gratifying experience from ICRDASIA-2020.

With best wishes

Dr. Meeniga Vijayalakshmi

Keynote Speaker



Vineeth N Balasubramanian

Head (AI) & Associate Professor,
Computer Science & Engineering,
Indian Institute of Technology Hyderabad,
Telangana, India.

Title: Towards Explainable and Robust AI Practice

Abstract: The last decade has seen rapid strides in Artificial Intelligence (AI) moving from being a fantasy to a reality that is a part of each one of our lives, embedded in various technologies. A catalyst of this rapid uptake has been the enormous success of deep learning methods for addressing problems in various domains including computer vision, natural language processing, and speech understanding. However, as AI makes its way into risk-sensitive and safety-critical applications such as healthcare, aerospace and finance, it is essential for AI models to not only make predictions but also be able to explain their predictions, and be robust to adversarial inputs. This talk will introduce the audience to this increasingly important area of explainable and robust AI, as well as describe some of our recent research in this domain including the role of causality in explainable AI, as well as the connection between explainability and adversarial robustness.

Bio: Vineeth N Balasubramanian is an Associate Professor in the Department of Computer Science and Engineering at the Indian Institute of Technology, Hyderabad (IIT-H), and currently also serves as the Head of the Department of Artificial Intelligence at IIT-H. His research interests include deep learning, machine learning, and computer vision. His research has resulted in ~100 peer-reviewed publications at various international venues, including top-tier ones such as ICML, CVPR, NeurIPS, ICCV, KDD, ICDM, and IEEE TPAMI. His PhD dissertation at Arizona State University on the Conformal Predictions framework was nominated for the Outstanding PhD Dissertation at the Department of Computer Science. He is an active reviewer/contributor at many conferences such as NeurIPS, CVPR, ICCV, AAI, IJCAI as well as journals including IEEE TPAMI, IEEE TNNLS, JMLR and Machine Learning, with recent awards as Outstanding Reviewer at CVPR 2019, ECCV 2020, BMVC 2020. His research is funded by various organizations including DST, MeITY, DRDO, Microsoft Research, Adobe, Intel, and Honeywell. He currently serves as the Secretary of the AAI India Chapter. For more details, please see <https://iith.ac.in/~vineethnb/>.

Best regards,
Vineeth

Keynote Speaker



Dr. Mohamed Khan Afthab Ahamed Khan

Assistant Professor,
Department of Mechanical Engineering,
UCSI University,
Malaysia.

Message

My sincere appreciation goes to the conference committee for extending their invitation to be a keynote speaker for this conference. I personally thank Institute for Engineering Research and Publication (IFERP) for their excellent efforts and dedications to Research and development within the field of science, engineering and technology.

Robotics technology influences every aspect of work and home. Robotics has the potential to positively transform lives and work practices, raise efficiency and safety levels and provide enhanced levels of service.

It is impossible to survive in today's world without science, engineering and technology. I am sure the knowledge gained and the knowledge shared during this conference will be an asset to the development of the human society. I would like to thank all those who submitted their papers, the program committee and many colleagues who offered their services in organizing the conference and making it a very successful one.

I take this opportunity to convey my best wishes from my heart for the success of this conference.

Thanks and Regards

A handwritten signature in black ink, appearing to read 'M.K.A. Ahamed Khan' with a stylized flourish at the end.

Dr.M.K.A.Ahamed Khan

*Assistant Prof UCSI UNIVERSITY, Cheras, Malaysia,
Faculty of Mechatronics Engineering*

International Conference on Robotics Design and
Applications using Wireless Sensor Networks,
IoT and Artificial Intelligence

ICRDASIA-2020

26th, 27th & 28th November, 2020
- Virtual Conference

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Date : 04-10-20

Place : Hyderabad

As you all are aware of the AICTE sponsored international conference (Virtual) ICRDASIA-2020 will be conducted during 26, 27 and 28th November 2020. The following are the college level committees for organizing the conference. I request to follow up the responsibilities assigned.

COLLEGE LEVEL COMMITTEES FOR THE CONFERENCE - ICRDASIA-2020			
S.No.	Name	Members	Responsibility
1	Organising committee	<ul style="list-style-type: none">• Dr.P.Sudhakar Rao Dean, R&D & Prof. ECE Dept.• Dr.K.Ramalinga Reddy Prof & HoD, ETE Dept.,GNITS• Dr.M.Seetha Prof & HoD, CSE Dept., GNITS• Dr.I.Raviprakash Reddy Prof & HoD, IT dept.• Dr.N.Malla Reddy Prof & HoD, EEE dept	Progress of all other committees are reviewed and appropriate directions given to all other committees
2	Technical committee	<ul style="list-style-type: none">• Dr.K.Ragini Prof., ECE,GNITS• Dr.N.Kalyani Prof., CSE Dept.• Dr.Supriya.V Associate Prof., IT Dept.• Dr. Annapurna Assoc. Prof., EEE Dept.• Dr. B.L.Rajkumar Prof., ETE Dept.	They will maintain all the received papers, group them, send them to review committee, correspond with authors, inform acceptance, rejection, modifications, etc. They would also communicate with publishers of the journals.
3	Finance committee	<ul style="list-style-type: none">• Dr.B.Venkateshulu Prof & HoD, ECE Dept ,GNITS• Dr.M.Vijayalakshmi Assoc..Prof.,ECE Dept, GNITS	Maintain accounts, give approval for the expenditure etc.
4	Publication committee	<ul style="list-style-type: none">• Dr.Swapna.R Assoc.Prof ECE Dept.,GNITS• Dr.M.Vijayalakshmi Assist. Prof., ,ETE Dept,GNITS• Dr.A.Sarada, Prof., CSE Dept., GNITS• Dr. R.Nageswara Rao Assoc.Prof.,EEE Dept., GNITS• Dr.Ch.Anitha Assoc. Prof., ,IT Dept.,GNITS	The paper submission formats are decided by this committee. Member shall have the skills of formatting the text as per the norms set. They would ultimately responsible for the final proceedings. They would also be responsible for on-line conducting the conference.

5	Registration and publicity Committee	<ul style="list-style-type: none"> • Dr.Renuka Methre Prof., ,ECE Dept, GNITS • Dr.G. Sreevalli Assist Prof., ETE Dept, GNITS • Dr.G.Malini Devi Asst.Prof, CSE Dept. GNITS • Mrs.E. Gouthami Assist.Prof.,EEE Dept., GNITS • Dr. S.Ramacharan Assoc.Prof.,IT Dept., GNITS • Dr.D.V.LParameswari Sr.Assist.Prof., CSE Dept., GNITS 	They are responsible for the follow up of website / portal creation and maintenance of the registration data. They will be coordinating the publication committee and technical committee (during the conference).They also coordinate the distribution of certificates to the presenters of the papers if necessary.
6	Audio, Video, Visual & other Arranging Committee	<ul style="list-style-type: none"> • Mr.T.V Rama Mohan Reddy HoD ,Civil Dept., GNITS • Dr. C Padmaja Assist Prof., ECE Dept, GNITS • Dr.P.Rama Krishna Reddy Prof., EEE Dept.,GNITS 	They are responsible for Network connectivity and arrangements related works for the conference. They are also responsible for session timing follow up along with publication committee.

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ABSTRACTS

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Region-based Object Detection and Classification using Faster R-CNN

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Abstract

With the advent of Deep Learning, the machine learning systems are able to recognize and classify objects of interest in an image. Various advancement has been done in the field of object recognition and classification. Our research work focusses on improving the R-CNN, Fast R-CNN, YOLO architecture. The work focused on using Region Proposals Network(RPN) to extract region of interest in an image. RPN outputs an image based on the objectless s core. The output objects are subjected to Roll Polling for classification. Our research work focusses on training Faster R-CNN using custom based data set of images. Our trained network efficiently detects objects from an image consisting of multiple objects. Our network requires minimum GPU capability of 3.0 or higher..

Real Time Translator for Sign Languages

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Abstract

Sign language is a medium of conversation for physically disabled people. These people communicate via different actions of hands, where each different action means something. This article focuses on removing the barrier of communication between normal and physically disabled people. The article aims to translate the sign language in real time by mobile camera such that it can act as a medium of conversation between normal and deaf or dumb people

Performance Analysis on Wisconsin Breast Cancer Dataset Using Ensemble Model

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Abstract

Breast cancer is an invasive cancer that develops from breast tissue. It is one of the most dangerous diseases that are very effective for women in the world. Detecting the cancer through various automatic diagnostic techniques is very necessary. Many machine learning algorithms are available for prediction and diagnosis of breast cancer. Some of the machine learning algorithms are K-Nearest Neighbor (KNN), it suffers from curse of dimensionality, Naïve Bayes, which has disadvantage assumption of independent predictors, Support Vector Machine (SVM), its disadvantage is Extensive memory requirement and Multilayer Perceptron which gives best result for unstructured data but in study structured data is used. Wisconsin Breast Cancer Dataset is used which contains 569 rows and 30 features. Construction of hybrid classifier for Support Vector Machines and decision trees in WEKA gives accuracy of 91%. In this paper Ensemble method is used to compute best method for diagnosing breast cancer disease. Ensemble methods work well to speed up prediction accuracy. The performance parameters like parameters like precision, recall, f1 score were analyzed to identify the best classification method. The primary objective behind using Ensemble learning is to reduce the variables and diagnose the disease effectively. In this approach the features were reduced to sixteen variables. It is ascertained that the classification accuracy has been improved by ensemble method of random forest and gradient boosting algorithm before and after attribute removal. Before the accuracy is 96.07 percent and these selected sixteen variables gave good accuracy of about 97.23% than other set of variables..

Use of State-of-the-art Productive Algorithms for Recommending Periodic Item sets with the help of Data Mining

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Abstract

The science of data analytics has great significant place in the task of decision making. Perceptions pertaining to such analysis have a wide range of advantages ranging from growth in revenue to cost cutting and enhanced competitive edge. Nevertheless, the invisible patterns of the frequent item sets take more time to dig up, the more the data-the more the time taken. Also considerable memory consumption is necessary for mining of hidden patterns of the recurrent item sets caused by heavy computation by the algorithm. As a result, an effective algorithm is needed in the mining of concealed patterns of the frequent item sets with a less run time, occupying less memory, with increase in data volume over time. In this paper, a review and an analogy of different algorithms for Frequent Pattern Mining (FPM) are presented so as to enable to develop a more efficient FPM algorithm.

Index terms

Data Analytics, Data Mining, Frequent Item set

Protecting smart home Environment using machine learning Algorithm Based on IoT

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Abstract

In today's data Technology driven society, automation systems square measure creating people's life easier and cozy than ever before. we have a tendency to decision the planned system IoT-Home Advanced Security System or IoT-Home Advance Security for brief. IoT-Home Advance Security System was established exploitation Python three and may be dead in 2 modes of operation. The in-line mode permits the IoT-Home Advance Security System to be put in in-line with the traffic within a Raspberry Pi or a Router. with in the in-line mode IoT-Home Advance Security System acts as Associate in Nursing IPS that may observe and block threats moreover as alert the user. The second mode is that the passive mode wherever IoT-Home Advance Security System in not connected in-line with the traffic and may act as Associate in Nursing IDS that passively monitors the traffic, detective work threats and alerting the user, however not obstruction the attack. IoT-Home Advance Security System was evaluated via four testing eventualities

The Comprehensive Study of Automated Region Masking of Latent Overlapped Fingerprints

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Abstract

Later, Fingerprints have also evolved that test biometric technology in any more specific way. Extracted biometrics of criminal investigations which are recovered are most present within fingerprint images. They still belong to the overlapping form, making it harder to describe and thus separating overlapping fingerprints was a challenge. The use of software tool also contributed to a traditional process for masking the two identical fingerprints that have been generated across the region. The region masks are also used to differentiate the fingerprints. This requires the physical attention of the user to obtain the separate area masks that take time to identify. This paper proposes a new algorithm which is designed within the framework with area covering up the same interlaced fingerprints. In order to achieve and monitor the optimum area masks, the mild approach to distortion, oxidation and retraction is often primary.

Index terms

Latent overlapped fingerprints, Region masking, Fully automated system, Region segmentation

The Comprehensive Study of Nighttime Image Enhancement Using a New Illumination Boost Algorithm

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Abstract

Through low visibility, inadequate intensity, and implicit color, nighttime photographs are frequently obtained. Consequently, in order obtain adequate high resolution images, it's also likely to promote these things and also to replace the illuminated boost algorithm during this analysis. Image enhancement is to highlight some features of an images importance to boost object representation and better evaluate the future. Technologies for night vision include three types of infrared imaging, near-infrared lightning, including low-light processing technologies. Later, it increases visibility, increases contrast, and better processes the color of nighttime photos. The proposed algorithm implements only a small number of steps to realized its set objectives which involves many computing principles. An order to verify the algorithm performance, extensive simulations and assessments are carried out on various real deteriorated overnight images. It is also contrasted with contemporary algorithms, and the obtained results from these comparisons are then assessed using two distinct criteria for evaluating quality of images. This become apparent from the results of the studies and similarities obtained that the algorithm will provide acceptable results, providing visually appealing results and outperforming the comparison algorithm in terms of scored precision and graphical consistency.

Index terms

Image Enhancement, Boost algorithm, Bright channel prior (BCP), Naturalness preserved enhancement (NPE), Multi-scale retinex (MSR) algorithm, Improved Multi-scale retinex (IMSR) algorithm, Nighttime illumination

A Literature Review on Palmprint Recognition System

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Abstract

This paper provides an outline of some current palmprint analysis. Palmprint recognition could be a physiological biometric technique utilized to the identity of the humans. The area around the wrist and fingers is called palmprint. Palmprints having varied options such as geometry-based, a line-based, texture-based, orientation-based, statistical-based, point-based features that are utilized individually or with the mixture of two or multiple features for fast and proper identification purpose. Palm features are distinctive for each individual and have rich data that will be used for feature extraction. Palm print recognition is taken into account the foremost appropriate and reliable biometric recognition system because of its merits, like a low price, user-friendliness, high speed, and high accuracy. Exploring palm prints as a biometric modality several issues arise like skin distortion, computational complexity, and variety of various palm regions. Palmprints having multiple features due to palm covers a lot of skin area over a fingerprint. Palmprint recognition is achieved by the subsequent steps: Palm print acquisition, Pre-processing, Feature extraction, and Palmprint matching. The Region of Interest (ROI) could be an important issue in palmprint image to extract. In this small area, there are many features to detect. To detect these features, several techniques depend upon what kind of feature needs to extract. The palmprint features are split into different categories such as texture, line, statistical, and subspace based techniques.

Index Terms

Palmprint recognition, pre-processing, feature extraction, classification

Control of external devices with thoughts by using BCI (Brain Computer Interface) for IoT-EEG calibration system

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Abstract

A Brain Computer Interface (BCI) is a device that translates neuronal information into commands capable of controlling external software or hardware such as a computer or robotic arm. Brain computer interface (BCI) is used in the treatment of neurological disorders and thus helps in the restoration of sensory and motor functions.

BCIs are often used as assisted living devices for individuals suffering with motor or sensory impairments. BCI devices are of two types: invasive and non-invasive. There are a wide range of non-invasive BCI headset devices that typically use Electroencephalography (EEG), Functional Magnetic Resonance Imaging (fMRI) and Magnetoencephalography (MEG) for monitoring and measuring brain activity. All the existing devices lack an efficient way to train mental commands, maintain different human brain profiles, and a standard way to integrate with IoT devices.

Brain-computer interface software for EEG headsets is developed which helps in training mental commands with calibration and provides easy integration with IoT devices. Further it can be enhanced by including REST API Services. The BCI software offers an interface which can accurately classify the signals of the brain using advanced techniques from machine learning and deep learning domains. The person will be able to control external devices with his thoughts. The EEG headset is used to capture the brain waves of the person (signal acquisition phase) and then it is processed using a machine learning model to classify and interpret it. (in signal processing phase).

Index terms

BCI, Electroencephalography, REST (Representational State Transfer) API services, Neurological disorder

Intelligent Neonatal Monitoring and Disease Prediction Using Machine Learning

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Abstract

The first 28 days of life which is called the neonatal period, represents the most vulnerable time for a child's survival. In 2016, 2.6 million deaths, approximately 46% of all under-five deaths occurred. This roughly translates to 7000 newborn deaths every day. Neonates are prone to diseases because of their under developed immune system which makes them more vulnerable to serious bacterial, fungal and viral infections. The common neonatal diseases are Down syndrome, Cystic Fibrosis and Blood Cell Disorder. Monitoring neonatal heart rate data can aid in understanding development and diagnosing conditions such as neonatal sepsis.

Technological advances have caused a decrease in the number of infant deaths. One of the mechanisms that can be vital to saving the lives of these infants is through continuous monitoring and early diagnosis, which can substantially increase the chance of survival.

Medical Literature has indicated a relationship between heart rate variability and the condition of an infant. Therefore, we will analyse the dataset containing the heart rates of premature infants which will be recorded in the Neonatal Intensive Care Unit. These heart rates will be collected at a sampling rate of one minute, which is the common sampling rate in clinical setting. The aim of our study is to monitor and predict the possibility of any disease that the neonate might encounter.

In our proposed system, heart beat and temperature parameters read by the sensors will be sent to the cloud using GSM module. Using machine learning algorithms, abnormal conditions will be detected. The system alerts with a buzzer and an SMS notification will be sent to the user. The system will then predict the neonate's disease

Senile Psychosis

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Abstract

Alzheimer's disease is a progressive disease that destroys memory and other important mental functions. Brain cell connections and the cells themselves degenerate and die, eventually destroying memory and other important mental functions. Memory loss and confusion are the main symptoms. The effects may vary from suicidal thoughts and behaviours, inability to communicate pain, inability to communicate symptoms of illnesses to death of Alzheimer patient. Hence, a care-taker needed to be appointed for continuous monitoring and regular check-ups, medication.

A digitalized care-taker is acting as a substitution source for human care-taker in recent years with sophisticated features with higher level abstraction but under the conditions such as high speed network connectivity, disclosure of confidential information, timely reminders which requires personal data, and mainly, the patient must be user of digitalized interface i.e.; Smartphones. Though these systems and interfaces are proved to be highly reliable, the trivial conditions expose some pitfalls like network delays, low security user data protection.

This project proposes a system which minimizes the patient interaction with smart phone interfaces, accommodating ease of use by capturing communications with microphones, by process automation, and enabling the reminders. It provides peculiar features by cloning the real time reminder application where input would be fed automatically by voice and speech processing algorithm. It overcomes the pitfalls of existing system by working on provision of high security and data protection of confidential, personal, and medication information of patient.

Machine Learning Approach for Stress Detection using BioSignals

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Abstract

Psychological Stress and Depression have been pinpointed repeatedly as significant issues contributing to the weakening of physical and mental health. Nowadays stress is considered as the biggest threat to individual's well-being. However, stress can be a positive aspect in our daily life, but too much stress can rather be harmful to physical and emotional healthiness where as managing it, is a major concern for populations around the world. Hence, there is significant importance to detect stress in its early stages, before it turns into severe problem. Automatic stress detection can be executed along the four main modalities, viz., Psychological, Physiological, Behavioural and Social Media Interaction modalities, along with appropriate measurements, in order to give hints about the most appropriate ways and means to be used for Psychological Stress Detection.

In Existing system it has proved that stress level can be detected and validated through Heart Rate, Humidity response, Temperature response. These parameters were measured through Fuzzy Logic algorithm. Stress detection in voice gives a great alternative for obtaining a non- invasive way to extract information about a possible deception from a person declaration. Lippold microtremor can be detected through FFT signal processing when a person is under psychological pressure.

This paper speaks about the psychological, physiological, and behavioural modalities for stress detection. The idea is to create a system that accounts these points to add more independency, value and aim to improve the lives of the common people. Proposed system classifies the person as 'stressed' 'not stressed' by taking into account the pupil diameter size and speech of the participant. Threshold calculations are used on the pupil diameter size to detect whether the person is stressed or not and CNN for speech classification.

Index terms

Stress Detection, Pupil Diameter Size, Speech, CNN, Threshold Calculations

Early Action Prediction using VGG16 Model and Bidirectional LSTM

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Abstract

Action prediction plays a key function, where an expected action needs to be identified before the action is completely performed. Prediction means inferring a potential action until it occurs at its early stage. This paper emphasizes on early action prediction, to predict an action before it occurs. In real time scenarios, the early prediction can be very crucial and has many applications like automated driving system, healthcare, video surveillance and other scenarios where a proactive action is needed before the situation goes out of control. VGG16 model is used for the early action prediction which is a convolutional neural network with 16 layers depth. Besides its capability of classifying objects in the frames, the availability of model weights enhances its capability. The model weights are available freely and preferred to used in different applications or models. The VGG-16 model along with Bidirectional structure of Lstm enables the network to provide both backward and forward information at every time step. The results of the proposed approach increased observation ratio ranging from 0.1 to 1.0 compared with the accuracy of GAN model

Disease Detection and Automated Grading of Mangoes Employing Statistical, Color and LBP Features

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Abstract

Mango is a very significant fruit worldwide because of its rich nutritional and medicinal importance. Conventionally disease identification and ripening stage classification is done by human experts which is strenuous, burdensome and a challenging task in food processing industry. An image processing approach for disease detection in mangoes and a machine learning approach for ripening stage classification has been proposed. It is demonstrated that the ensemble classifier and K-nearest neighbor classifier outperform their counterparts-Discriminant classifier, Naive Bayes classifier and Decision tree classifier in terms of confusion matrix, accuracy, precision, specificity, recall and F-score.

Index terms

Disease identification, Classifiers, Ripening stage of Mangoes, statistical features, color features, F-score

Fault Tolerant and Monitoring System in Hazardous Environment using Labview

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Abstract

Hazard is a state which will threaten the surrounding nature this cause natural disasters such as storm, earthquakes, extreme temperatures, decibel levels and release of toxic gas takes place. In hazardous condition like underground mines there is a possibility of methane gas leakage due to which people die so the gas should be detected and diluted. Dilution can be done by pumping the atmospheric air with the help of the blower. Incase if there is a fault in the first blower then second blower will be enabled by automatic switching mechanism also called fault tolerance. In the existing system the methane concentration cannot be monitored and sufficient air was not provided to weaken the toxic gas due to this the miners life was put into risk. Limitations of the existing system include breathing apparatus, reviving apparatus and safety rooms.

In order to reduce the human death ratio the above two conditions are to be fulfilled. The proposed system comprises of a compressed natural gas sensor & a blower connected to the LABVIEW where the concentration of methane gas present in underground coal mine is controlled and the signal is generated by LABVIEW. When the methane gas concentration reaches 600ppm, the blower pumps the atmospheric air into the underground coal mine, in order to dilute the methane gas. Incase of blower failure, a proximity sensor which is present at the blower detects & indicates the fault to LABVIEW automatic switching is made and the information is sent to the mechanical department. Incase of unpredictable failure in the Blower, the information is also sent to the rescue team in order to alert them. In the critical situation, the emergency signal is sent to the fire department GSM network using LABVIEW, incase of any personal health problem for the miners working underground, a health trigger is provided inside the mine, when it is pressed the information is sent to the first aid and rescue team via LabVIEW.

In this security system, each individual can be provided with a Torched Helmet, an Individual Microphone and a Pulse Sensor in the form of a wrist watch to monitor the health status of each individual. This can avoid them in leading to emergency conditions, due to their personal health disorder. In addition the concept of this model can be applied in the gas storage area, where the blast due to gas leakage takes place.

Drone Technology to Combat Covid-19

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Abstract

Objective: The advancement of science & technology areas in related to data science, artificial intelligence, deep learning and machine learning are subsidizing towards COVID-19. The current aim of the our study is to discourse the diverse attributes of latest technology practiced to combat against COVID-19 catastrophe at various scales, involving medical image processing, computational biology, prediction outcomes and disease tracking system.

Methods: Our present review paper displays a prompt health related tracking drone manufacturing and also address the several examinations to be met in the assembling of drones to save our human lives and recommend forthcoming research directions. Further, a brief review is done on the different Internet of things (IoT) used for assessing diverse aspects and with the same modern technologies to be employed for tackling COVID-19 pandemic.

Results: We have specified an interface of IoT, artificial intelligence, prediction and 5G Network technology which are most advanced soft wares accustomed to decrease and fight against the global outburst of COVID-19. Although, several literature have highlighted about health care system but current evidence about usage of different studies relating to modern technology towards COVID-19 is limited. Hence, we have thrown lights on its applications and contributions of this latest drone technology in this combat.

Conclusions: Although the global impact of COVID-19 pandemic continues and complementary efforts are initiated with help of emerging advanced technologies. The present modern technology and its progression has contributed in improving people's lives. Till the time for cure on such pandemic disease we need to evaluate the infected person at a robust rate by artificial intelligence which is most significant technique to combat the transmission of the disease.

Index terms

Artificial intelligence, COVID-19, Internet of things, Drone Technology, Data science cycle

Copy-Move Image Forgery Detection using Scale Invariant Feature Transform

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Abstract

Digital image forgery is a one of multimedia security whose objective is to show the wicked manipulations in digital images. Among different types of image forgery, copy-move forgery detection (CMFD) is the most popular one where a part of the original image is copied and pasted at another position in the same image. Various methods have been developed in the past few years. to achieve geometric transformation like rotation and scaling, a novel methodology based on Scale Invariant Features Transform (SIFT) is proposed.

The proposed algorithm mainly involves in feature matching in which features are extracted from each block by computing the dot product between the unit vectors. Random Sample Consensus (RANSAC) algorithm is used to remove the false positive matches. The experimental results of the algorithm are presented to confirm that the technique can extract more accurate results compared with existing forgery detection methods.

Index terms

SIFT, RANSAC, CMFD, Keypoint Matching

A Review on Advanced Wireless Communication Technologies for Smart City

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Abstract

In the present scenario, smart city electrification has major challenges related to reliable transmission, fast response, fault tracing, data security and economic rate of electricity. These are the main objectives for smart city electrification. To communicate bi-directional real-time information related to power transmission, distribution, consumption, utilisation, fault condition, over current, electricity consumption and electric bill communication technologies are needed. Information transfer rate, enhanced speed, reliability of operation and grid efficiency also depends upon speed of communication technology. This paper addresses the issue and opportunities of latest communication technologies such as 4G, 4G LTE and 5G etc. for fast and real time information communication. Also provides an improved review of these communication technologies and their research challenges in the field of smart grid communication. This review will helpful amongst the research community to explore their research

An IOT Based Air and Noise Pollution Monitoring System

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Abstract

Despite the growing trends in the science and technology, India is facing the wrath of poor air quality and particulate matter such as pollen; smoke and dust have only made it worse. Studies show a steep rise in the number of people suffering from asthma and rhinitis from 1964 to 2018. Urban planting makes the people more vulnerable due to the interaction of pollen with industrial and urban motor vehicular gaseous emissions. Noise, on the other hand is an underestimated form of pollution. It has various adverse effects on the body such as cardiovascular effects, sleep disturbance, poorer work environment and hearing impairment. Our objective is to measure the air quality i.e. pollen count along with the hazardous gases and to monitor the noise levels of a particular area. We also aspire to alert people about hazardous gases and noise levels in the surrounding environment. The proposed system uses an Arduino Uno, a PM2.5 GP2Y1010AU0F Dust Smoke Particle Sensor along with MQ-135, MQ-9 sensors. Ada fruit electret microphone is used to measure the sound level in decibels which can be displayed on a 1.3 inch SPI OLED for reference. Whenever the particle count and the concentration of the gases (in PPM) reaches a dangerous level, a buzzer gets activated. On the other hand, when the sound levels go beyond a certain point an LED is turned on. A Wi-Fi module is used to push the data onto the cloud which can be later used for live tracking on a mobile phone.

Index terms

Arduino Uno, PM2.5 GP2Y1010AU0F Dust Smoke Particle Sensor, MQ-135, MQ-9, Node MCU, Sound Sensor

Estimation of Tropospheric Scintillation Effects

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Abstract

In the Satellite communications initially C-band (6/4 GHz) frequency link is used. It is already congested and not sufficient to cater the needs of present telecommunications. Then it will go to next higher frequency band i.e., Ku band (14/12 GHz) frequency link. While using the Ku band rain is the most significant impairment. The Ku-band filled up rapidly and not sufficient to reach the present demanded trends of Technology. Next higher frequency band is Ka band (30/20GHz) up and down frequency links. Advantages of Ka band are: High bandwidth relief the spectrum congestion, Efficient spectrum utilization, High quality of service, High speed of service, Better performance, Reduces interference and Power saving in receiver. While using the Ka band link scintillation effects are more significant impairment than rain attenuation. The “Scintillation” term means rapid signal fluctuations in phase and amplitude due turbulence. These fluctuations caused by irregularities of turbulence in humidity, temperature and pressure posses rapid changes in fraction time in the radio refractive index which is a function of wet term radio refractive index. Humidity fluctuations are more dominant at microwave propagation region result enhancement and degradation in amplitude and phase angle of satellite signals on the communication path. Hence there is a need to quantify the scintillation phenomenon for the antenna tracking systems and adaptive power control satellite communication system design with complete knowledge on scintillation characteristics like rapid fluctuations in signal amplitude and phase angles. It leads to the prediction and modelling of tropospheric scintillation effects for the accurate design of adaptive link control system in satellite communication systems.

India has special tropical climatic conditions and varies with respect to meteorological parameters like temperature, humidity and wind pressure. Total one year period divided into mainly three seasonal conditions like summer, rainy and winter seasons each season with four months of duration. To study the amplitude scintillation effects and analyze from estimated statistics called diurnal characteristics of tropospheric scintillations effects. This is perceived in the receiver as scintillation superimposed on the mean fade depth.

Experimental measurements of scintillation effects have done at the Rajiv Gandhi International (RGI) Airport Shamshabad, Hyderabad, India. The analysis of measurements will be done at a frequency of 20.2GHz and 30.5 GHz and path elevation of 64.67°. Matlab software and Origin Pro 8 tool kits are used for simulation, statistical and graphical results. This new models give excellent agreement with ITUR model and is applicable to any Ka band satellite adaptive link control systems.

IoT Based Automated Irrigation System

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Abstract

As India is the second largest country in the world with the increasing population day by day, Increased food intake, quality food demand, Agriculture's financial and environmental effects contribute to the use of Agricultural information technology, which comes from the agricultural sector, Under the heading of precision farming. Web of stuff (IOT) is a technology that has been increasing rapidly in recent years and it gives various benefits to agriculture. To meet the food requirements of the growing population there is need to improve agricultural production. Present days everyone wants to monitor and control their work from anywhere by using their digital devices like smart phones and laptops. Monitoring and controlling the devices or appliances from a distant place became a reality with Internet of Things. Automated irrigation system is one of the most advantageous applications of the IOT technology. The soil condition parameters such as moisture, humidity and temperature are important for getting high yields from the field while farming. The proposed system measures these parameters using different sensors and regulates the supply of water by controlling the motor based on the requirements of the field and crop. The soil parameters values, motor status, water levels in the source and power condition in the field will be intimated to the user in the form of messages to the registered mobile and the data can also be viewed in the website using a url provided through IOT platform. The proposed system reduces the human intervention and water wastage; increases crop yields.

Key Words

Soil parameters, sensors, IOT, automatic irrigation, micro controller

Charge Status Estimation of a Lithium Ion Battery in an Electric Vehicle Using Kalman Filter and Open Circuit Voltage Method

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Abstract

In Present scenario Internal Combustion Engines [ICE] is overcome by Electric Vehicles [EV] due to advantages like reduction in carbon-di-oxide [CO₂] emission, cost. Advancement in electric vehicles are extensively going on and one such concept is Battery management system [BMS] in Battery Electric vehicle. In Battery Electric Vehicle there are many types of batteries and from the literature survey Lithium Ion Battery can be concluded to be suitable as it is advantageous in weight, cost, energy density and many aspects. In Battery electric vehicle Battery plays an important role. Battery may be overcharged or it may undergo faults. Hence a reliable management system is required to control the Electric vehicle [EV]. In this paper two battery charge estimation models namely, open circuit voltage and Kalman filter has been considered. From the simulation results obtained it is found that data retrieval is difficult in open circuit voltage method can be achieved using Kalman filter and found out to be satisfactory.

Index terms

Battery management system, Open Circuit Voltage, Kalman filter, State of Charge

Fingerprint Based ATM System

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Abstract

Fingerprint Based ATM System is a device where fingerprint of the user is used as an authentication. The fingerprint features are different for each human being so the user can be identified uniquely. Instead of using ATM card Fingerprint based ATM device is safer and secure. There is no worry of losing ATM card and no need to carry ATM card in your wallet. You just must use your fingerprint to do any banking transaction. The user must enrol using his fingerprint and he must enter the passcode given during enrolling to do further transaction. The user can withdraw money from his account. User can transfer money to various accounts by mentioning account number. To withdraw money user must enter the account he wants to withdraw. The user must have appropriate balance in his ATM account to do transaction. User can view the balance available in his respective account.

A Trust Model of Cloud Scheduling Based On Data Integrity Using Ant Lion Optimizer

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Abstract

In the internet, a number of services have become flexible and cost-effective because of cloud computing. Security is the major hitch in cloud computing and many researchers have studied and discussed the problems relating to this issue. Various techniques are requiring ensuring the integrity of data which is the integral part of cloud storage adoption. Five different trust attributes are collected from third party and its trust model in this work and integrity of data are assured through the servers. For optimal scheduling Ant Lion Optimizer (ALO) algorithm is used which is proposed and contrasted with Particle Swarm Optimization (PSO).

Index terms

Cloud computing, data integrity, third party trust model, Particle Swarm Optimization (PSO) and Ant Lion Optimizer (ALO) Algorithm

Temperature Aware Routing Protocols for Wireless Body Area Networks to Reduce the Node Temperature

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Abstract

Wireless Body Area Networks are the focus of researchers and engineering industries due to many applications. Remote health monitoring for as well as a military purpose were implanted inside the skin of the body to sense the essential aspect is the primary necessary regular and consistent operation of a sensor node for a prolonged effect in a rising of the temperature of respective tissue, where it is attached. Also, the embedded, biomedical sensor nodes produce electromagnetic radiations that pose a severe threat of damaging sensitive tissues in the human body. WBANs primarily focused on minimizing temperature, while overlooking the energy conservation goal and optimization of route selection. Analytical simulations are conducted by a similar QoS parameter. The result depicts better performance in terms of the node temperature, throughput, power maintenance, and temperature control concerning the state of the art wireless body area network.

Index terms

Wireless Body Area Network, Temperature, Sensor, Human body

A Sophisticated Ontology Based Stock Price Prediction System

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Abstract

Deep learning allows computational models to learn representation of data that are composed of multiple processing layers. The deep learning has enabled trading algorithms to predict stock price movements. Deep learning is a complicated structure in big data sets which indicates the machine to change its internal parameters which are used to compute the representation in each layer from its representation in previous layer. Previously there exists many techniques/methods/algorithms to predict the stock price movements such as LSTM, CNN and so on. DeepClue is one such system which was developed by Lei Shi, Zhiyang Teng, Le Wang, Yue Zang, and Alexander Binder, that interprets text based deep learning models in prediction of stock price. DeepClue was developed using DNN that extracts the relevant predictive factors by applying an algorithm. Over the extracted factors explored and displaying these factors in a visualization interface which is effective to communicate to the end users about the model and also evaluation of integrated visualization system predicts the stock price movements. All the existing methods/ techniques/ algorithms were predicting the stock movements using the text based prediction. In present days most of the prediction processing procure the ontologies of respective domains. So adding them to the existing prediction algorithms would fetch a better performance. Hence adding advanced semantic technologies can improvise the accuracy in predicting the stock price movements.

The Comprehensive Study of Deep Convolutional Autoencoder Based Lossy Image Compression

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Abstract

Image compression was explored as a fundamental research topic and reduced the size of graphical file bytes without lowering the image quality. It later presents an architecture through lossy image compression. The leads of a convolutional Autoencoder (CAE) to achieve high performance. The reconstruction of an image in lossy compression is only an approximation of original data in which predictive coding and transform coding included. Deep learning has made significant progress in computer vision at different tasks and is increasingly being using. Two challenges are being involved in this image compression by convolutional Autoencoder. The first challenge is to design new CAE architecture to replace traditional transforms through the use of rate-distortion loss function. Another challenge is to create high energy-compact representation to use principal component analysis (PCA) to rotate CAE function maps and then use quantization and entropy coders for code generation. It shows that our approach surpasses conventional image coding algorithms through realizing a decrease in BD-rate on Kodak database images especially in comparison to JPEG 2000 and maintaining a mild complexity near JPEG 2000.

Index terms

Convolutional Auto encoder(CAE), Deep Learning, Image Compression, Principal component analysis (PCA)

Smart Application for Dyslexia Analysis in Native Language

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Abstract

Specific learning disability (SpLD) is a group of neurodevelopmental disorders manifesting as persistent difficulties in learning to efficiently read (dyslexia), write (dysgraphia) or perform mathematical calculations (dyscalculia) despite normal intelligence, conventional schooling, intact hearing and vision, adequate motivation and socio-cultural opportunity. They afflict 5-15% of school-going children.

At present many children with SpLD studying in non-English (vernacular) medium schools, and in rural areas, are going undetected for non-availability especially of standardized educational tests in their native language. It is necessary that the assessment of Dyslexia be carried in all languages that the child is exposed to. Since Telugu is the predominant medium of instruction in Telugu speaking states, this application provides a supporting aid with an adaptive and interactive education environment in Telugu language. The web application encompasses a multi-sensory teaching policy to make the Language and Math concepts understandable at a basic level.

Basic and Complex Circuits Using Reversible Gates

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Abstract

Processors of the various handheld devices like mobile phones, desktops, laptops, palmtops and more are very much useful in modern day lives. But the heating problem is constant for every device. This paper will determine a brief discussion of the propagation delay and on chip power consumed by each basic and complex circuit designed using existing reversible gates through VHDL, so that the heating problem in any device can be diminished. Hence a designer can choose the best reversible gates to operate for any logic circuit design. Moreover, this paper shows efficient design of the parity generators and a 4-bit ripple carry adder using reversible gates. Number of reversible gates used, garbage output, and percentage usage of outputs in implementing each combinational circuit is efficiently derived.

Performance Enhancement of MIMO-MC-CDMA Systems by Employing Various Diversity Combining Techniques

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Abstract

Wireless communication is a system of transferring data from single point to other, without using similar wires, cables or any physical medium. In this paper, plain (MC-CDMA) scheme is implemented and the presentation in expressions of (BER) is achieved. The theoretical performance of the MC-CDMA scheme is also calculated and related using the simulated presentation to verify the accuracy of the system. Then, the MIMO systems are implemented and passed through the MCCDMA system with multiple input multiple output (MISO) antenna diversity and SIMO(single input multiple output) in the Rayleigh flat fading channel. The combination of MIMO and MC-CDMA scheme is named as MIMO-MC-CDMA system. By the side of the receiver, the acknowledged signals of MIMO-MC-CDMA system are united in the frequency domain in command to assemble the complete acknowledged signal energy spread on dissimilar subcarriers assuming flawless channel state information (CSI). The combining schemes used are the maximum ratio combining (MRC 1X2) with MIMO-MC-CDMA scheme, equal gain combining (EGC 1X2) with MIMO-MC-CDMA system, (MMSE 2X1) with the MIMO-MC-CDMA system, maximum likelihood combining (MLD 2x1,MLD 2x2) with MIMO-MC-CDMA system then the performance of these combining schemes will be measured with respect to the SISO-MC-CDMA systems at the receiver. The MLD (2x1) is combined with MLD (2x2).

Index terms

CDMA, OFDM, MC-CDMA, SISO, MIMO, MIMO-OFDM, STBC, EGC, MRC, MMSE, MLD, Diversity, BER

Area and Power Optimized D-flip flop and Subtractor

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Abstract

Low power is essential in today's technology. It is most significant with high speed, small size and stability. So, power reduction is most important in modern technology using VLSI design techniques. Today most of the market necessities require low power, long run time and market which also deserve small size and high speed. In this paper several logic circuits DFF with 5 transistors and sub tractor circuit using powerless XOR gate and Groundless XNOR gates are implemented. In the proposed DFF, the area can be decreased by 62% & substarctor circuit, area decreased by 80% and power consumption of DFF and subtractor circuit are 15.4 μ W and 13.76 μ W respectively, but these are very less as compared to existing techniques.

Index terms

D FF, NMOS, PMOS, VLSI, P-XOR, G-XNOR

Design of High Speed Approximate Redundant Binary Multiplier

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Abstract

As technology scaling is reaching its limits, new approaches have been proposed for computational efficiency. In error tolerant applications a guaranteed high performance and low power circuits are designed using approximate computing technique. In this project, the design of approximate redundant binary multiplier is studied and implemented. A high speed approximate redundant binary multiplier is designed by using two redundant binary 4:2 compressors. Then comparison in terms of power, delay, area and signal rate of approximate redundant binary multiplier (using conventional modified booth algorithm) with high speed approximate redundant binary multiplier is done using Xilinx tool.

The Comprehensive Study of Deep Co-Occurrence Feature Learning For Visual Object Recognition

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Abstract

Latterly, Visual object recognition owing to the slight distinctions among subgroups could be highly tough in fine-grained areas. Discriminatory markers also are really distributed, allowing traditional object detection techniques will struggle with huge variation in such a posture which is regularly created in all of these environments. Image-normalization attempts to match exemplar preparation from the complete item, whether bit by bit as well as generally, Factoring the disparity from posture and point of view efficiently. Previous consists of tasks in conceptually costly filtration systems to component location, so thorough monitoring was necessary. This report suggests dual angle-normalized adjectives focused upon conceptually actual models for nonlinear sections. The former has used this concept for properly monitored DPM pieces. The action takes advantage of unfortunate semantic images to understand intra-component correspondence, modeling pre-normalized features from inherent sections into the unsupervised DPM. These models allow for pool position in point of view, thus enabling activities like good-grain identification and predictive attributes.

Index terms

Visual object recognition, Convolutional neural network (CNN), Histogram of Oriented Gradients (HOG), Support Vector Machine (SVM)

Detection of Plasma Bubbles using Ground Based GNSS Receiver Data Network

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Abstract

The most significant contributor of error in Global Navigation Satellite System (GNSS) positioning is the ionosphere. The ionospheric layer induces errors in trans-ionospheric GNSS signal resulting in signal delay, signal distortion and loss of data. Low latitudes are the most affected regions owing to the fact that the ionosphere in this part of earth experiences excessive perturbations. GNSS signal errors need to be detected and corrected to improve positional and navigational accuracy. Most of these errors occur during the post-sunset hours due to Equatorial Plasma Bubbles (EPBs). EPBs occur during higher level of solar activity which results in greater Total Electron Content (TEC) disturbances. This paper proposes an efficient EPB detector based on Rate of TEC Index (ROTI) using global continuous data. In this work, GNSS data is downloaded from Scripps Orbit and Permanent Array Center (SOPAC) archives. The data in Receiver Independent Exchange (RINEX) format has been collected from the IISC station, Bangalore, Karnataka (latitude- 13.0219°N, longitude-77.5671°E) in the southern part of India for half of the 24th solar cycle from the year 2014-2019. The results indicate an increased ionospheric activity during the equinoxes and the occurrence of winter anomaly.

Sqoop Usage in Import and Export Process of Hadoop Distributed File System Some Observation and Recommendations to Handle Common Errors

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Abstract

The Hadoop framework provides a way of storing and processing the huge amounts of the data. The social media like Facebook, twitter and amazon uses Hadoop eco system tools so as to store the data in Hadoop distributed file system and to process the data Map Reduce (MR). The current work describes the usage of Sqoop in the process of import and export with HDFS. The work involves various possible import/export commands supported by the tool Sqoop in the eco system of Hadoop. The importance of the work is to highlight the common errors while installing Sqoop and working with Sqoop.

Many developers and researchers were using Sqoop so as to perform the import/export process and to handle the source data in the relational format. In the current work the connectivity between mysql and sqoop were presented and various commands usage along with the results were presented. The outcome of the work is for each command the possible errors encountered and the corresponding solution is mentioned. The common configuration settings we have to follow so as to handle the Sqoop without any errors is also mentioned.

Index terms

Import, Export, Hadoop, Sqoop, Configuration, Relational Source

A Literature Review on Hyperspectral Image Denoising

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Abstract

Hyperspectral images are three-dimensional images. These consist of two types of domains. They were spatial domain and spectral domain. Hyperspectral image contains very much contamination while capturing from a spectral camera. These images can be captured at a particular wavelength using the electromagnetic spectrum. To eliminate this noise various techniques are there. A few of them are 1. Global low-rank representation 2. Local low-rank representation, 3. Sparse representation etc. while eliminating this noise using various techniques, we can apply for many problems like target detection, material identification on the earth's surface, and agriculture field. Here we have discussed and analyzed with opposing approaches and existing strategies to solve the problems. Denoising approaches have thus been the key step toward developing object identification and classification in remote sensing imaging applications and military applications.

Index terms

Hyperspectral images, Global low-rank representation [8], Local low-rank representation [10], Sparse representation [10].

The Comprehensive Study of Full-Resolution Residual Networks for Sematic Segmentation of Street Scenes

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Abstract

Semantic Segmentation of an image plays important role in the current autonomous driving process. Semantic segmentation is currently based on pre-trained networks that are initially established to generate images almost a whole. While spectral efficiency is lacking in these networks, we propose a new ResNet network theory that proposes strong localization using two streams within our network, one stream has full image resolution allowing precise limits and another system dealing with a pooling assembly process to obtain the optimal complete image resolution. Same to that is ResNet also uses FRRN'S which displays the same properties. The colored merging path FRRUs act as persistent stress for the blue source, but they also can combine activities and carry high-level information to a core. This results in a network which integrates and evaluates features progressively on such a two-fold basis at dual resolutions.

Index terms

Residual neural Network (ResNet), Full resolution Residual Networks (FRRNs), Fully convolutional Network (FCN), Fully resolution residual units (FRRs).

Green IoT Application using Relaxation Based Algorithm

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Abstract

Enormous changes are being developed in Technology. Advancement in Technology is a progress of transforming it into many different dimensions. The recent advance in Technology is rapidly growing in the field of IOT. The lifestyle of human beings is becoming easy by the development of IOT technologies. Green Computing is another field where the face of development is to adhere. The green Computing has moved research into energy saving techniques for home computers to enterprise systems, client and server machines. E-hazards are to be avoided. To decrease the harm to environment and society a new way to handle computers is mandatory. Equipment recycling, reduction of paper usage, virtualization, cloud computing, power management, Green manufacturing are the key initiatives towards Green Computing. This paper studies new technology dimension of Green Computing IOT.

Index terms

IOT, Green Computing, Computer and IT

Performance of QAM System with Convolutional Codes

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Abstract

This system proposes a simple series form formula of the bit error rate (BER) for M-ary QAM signals under the AWGN channel. In the QAM modulation techniques used for calculation of BER with QAM system using fading channel. This work presents, a simulation tool MATLAB R2013a to study the performance analysis of Bit Error Rate (BER) V/S Signal to Noise ratio (SNR) E_b/N_0 , Since the BER is represented by the simple series form formula, the proposed approach frees us from the time-consuming computer simulations. Moreover, the proposed formula applies to arbitrary M-ary quadrature amplitude modulations (QAM). the project aims at developing a Simulink model to simulate using Matlab/Simulink Communication System Toolbox. Also, the BERTool under Matlab is used to evaluate the performance of each QAM technique through plotting the Bit Error Rate (BER) vs. the ratio of bit energy to noise power spectral density (E_b/N_0).

Index terms

bit error rate (BER), M-ary QAM, AWGN channel, SNR, BER Tool, Simulink.

Automotive Application using Edge Computing

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Abstract

With a lot of new technologies requiring real-time data processing, cloud computing has become difficult to implement, due to the requirement of high bandwidth and high latency. To overcome this issue, edge computing is used to process data at the network's edge. Edge computing is a distributed computing paradigm which brings computation and data storage closer to the location where it is needed. It is used to process time-sensitive data. The model we implemented was using Linux Foundation's open-source platform EdgeX Foundry to create an edge computing device. The model involved getting data from an on-board sensor (OBD-II) and GPS sensor of a car. The data is then observed and computed to the EdgeX server. The single server will send data to serve three real-life IoT use cases: auto insurance, supporting a smart city and building a personal driving record. The main aim of this model is to illustrate how Edge Computing can improve both latency and bandwidth usage needed for real-world IoT applications.

Index terms

Edge-Computing, On-Board Diagnostics, EdgeXFoundry, Network Edge

Training Based Channel Estimation Technique Using Improved LMS Algorithm for MIMO- OFDM System

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Abstract

In a wireless communication system, multiple-input multiple-output (MIMO) combined with Orthogonal Frequency Division Multiplexing (OFDM) can achieve a high data rate and better spectral efficiency. Channel estimation is very important for improving the performance of MIMO- OFDM system. Training based Channel estimation technique for MIMO-OFDM system under Rayleigh fading channel is proposed in this paper. The channel estimation using block type pilot arrangement is administered with Least Square (LS), Minimum Mean Square Error (MMSE), Least Mean Square (LMS) and improved LMS estimation algorithm through matlab simulation. In this paper the BER and MSE performances of LS, MMSE, LMS and Improved LMS algorithm with channel estimation techniques are analysed for different modulation techniques.

Index terms

channel estimation, least square, minimum mean square, least mean square, OFDM, MIMO-OFDM

A Context Aware Job Information Real-Time Delivery Framework for Pervasive Environment

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Abstract

Context-aware systems are getting rapid popularity towards enabling a pervasive computing environment over hand-held mobile devices, wearable devices, and Tablets. These systems deliver services tailored to the specific needs and user's context. The context-aware system services can utilize information about the user's context to adapt services based on the user's location. The prime aim of this research paper is to investigate and analyze the critical issues and challenges while delivering the job information to the job seekers when they migrate from one place to another in search of jobs. In addition, the research also tries to investigate the challenges faced by employers/ job providers when they search and recruit the right person for the right jobs. In this paper the issues and challenges investigated and analyzed were timeliness of information dissemination, opportunity missing, fake/genuine information, anywhere, anytime accessibility over small handheld devices. After rigorous analysis of the investigated issues and challenges in the existing state of art employment/job information dissemination systems, a real-time context-aware employment information delivery system framework for the pervasive environment is proposed. The research parameters considered are Preference of Job seekers, Location of Jobs, Context, Qualification, CGPA, Experience, Everywhere access at any time, and Identity. The paper used both the quantitative and qualitative approaches for proposing a research-based applied solution. Survey of job seekers, Interview of recruiters, and technical observation of the researcher are used for collecting the relevant facts to check the researchability of the issues and challenges. Protégé version 4.3 is used for modeling, Edraw-Max for designing the framework, Google Form for Survey, and Justin mind tool for Prototype design and testing. The framework and its Prototype was examined using a user acceptance test. The acceptance test indicated that 84.6% of target stakeholders accepted the proposed system framework as a new knowledge solution for the aforementioned issues and challenges in the employment sectors.

Index terms

Context-aware, Framework, Job Seeker, Job Providers, Mobile Devices, Pervasive Computing

Improved Training Based Channel Estimation Technique for MIMO-OFDM System

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Abstract

The MIMO and OFDM systems are combined for enhancing the received signal quality without increasing the channel bandwidth in a multi path fading environment. In a fading environment, Channel State Information (CSI) estimation is required to reconstruct the data at the receiver section of the MIMO-OFDM systems. For estimating the channel effects, pilot symbols are mixed with the data symbols and transmitted. The performance of training based channel estimation technique depends on the positions of pilot carriers. In the proposed work, Adaptive ABC optimization technique is used for finding the best positions of pilot signals such that the performance of MIMO-OFDM system is improved when compared to the fixed positions of pilot signals. The performance metrics used in this paper are BER, MSE. According to simulation results, LS channel estimation with Adaptive ABC optimization technique outperforms than the fixed pilot positions.

Performance Enhancement of MIMO-MC-CDMA Systems by Employing Various Diversity Combining Techniques

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Abstract

Wireless communication is a system of transferring data from single point to other, without using similar wires, cables or any physical medium. In this paper, plain (MC-CDMA) scheme is implemented and the presentation in expressions of (BER) is achieved. The theoretical performance of the MC-CDMA scheme is also calculated and related using the simulated presentation to verify the accuracy of the system. Then, the MIMO systems are implemented and passed through the MCCDMA system with multiple input multiple output (MISO) antenna diversity and SIMO (single input multiple output) in the Rayleigh flat fading channel. The combination of MIMO and MC-CDMA scheme is named as MIMO-MC-CDMA system. By the side of the receiver, the acknowledged signals of MIMO-MC-CDMA system are united in the frequency domain in command to assemble the complete acknowledged signal energy spread on dissimilar subcarriers assuming flawless channel state information (CSI). The combining schemes used are the maximum ratio combining (MRC 1X2) with MIMO-MC-CDMA scheme, equal gain combining (EGC 1X2) with MIMO-MC-CDMA system, (MMSE 2X1) with the MIMO-MC-CDMA system, maximum likelihood combining (MLD 2x1,MLD 2x2) with MIMO-MC-CDMA system then the performance of these combining schemes will be measured with respect to the SISO-MC-CDMA systems at the receiver. The MLD (2x1) is combined with MLD (2x2)

Index terms

CDMA, OFDM, MC-CDMA, SISO, MIMO, MIMO-OFDM, STBC, EGC, MRC, MMSE, MLD, Diversity, BER

Implementation of 4-bit ALU with Logical Obfuscation

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Abstract

The need of a computer in the modern world is inevitable, and the sole purpose is to compute calculations. ALU forms the fundamental part of any Central Processing Unit (CPU). And so, the encryption of an ALU is highly mandatory for the safety of the device as there are hardly any device without an ALU. A number of studies of hardware security aim to thwart piracy, overbuilding, and reverse engineering by obfuscating. This paper deals with the design of an n-bit ALU by implementing Combinational Logic Obfuscation using a hardware description language, Verilog HDL that is structurally modelled to extend the flexibility and reusability of the device. Moreover, the logic of obfuscation is used to enhance its security without compromising on the correct functionality and maximum efficiency of the device. The results will be verified using synthesis which proves the inclusion of the obfuscation module without a considerable increase in area, power overhead of the ALU.

Automotive Application Using Edge Computing

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Abstract

With a lot of new technologies requiring real-time data processing, cloud computing has become difficult to implement, due to the requirement of high bandwidth and high latency. To overcome this issue, edge computing is used to process data at the network's edge. Edge computing is a distributed computing paradigm which brings computation and data storage closer to the location where it is needed. It is used to process time-sensitive data. The model we implemented was using Linux Foundation's open source platform EdgeX Foundry to create an edge computing device.

The model involved getting data from an on-board sensor (OBD-II) and GPS sensor of a car. The data is then observed and computed to the EdgeX server. The single server will send data to serve three real-life IoT use cases: auto insurance, supporting a smart city and building a personal driving record. The main aim of this model is to illustrate how Edge Computing can improve both latency and bandwidth usage needed for real-world IoT applications.

Index terms

Edge-Computing, On-Board Diagnostics, EdgeXFoundry, GPS, Raspberry Pi, Network Edge, database, JUPYTER

Design and Implementation of Smart Car Parking System using LabView

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Abstract

Due to rapid proliferation in the number of vehicles on the road, finding a vacant car parking space is becoming challenging and ubiquitous in every major city, resulting traffic problems are bound to exist. Increase in traffic causes the number of accidents that cause serious bodily harm to the road users, the pollution caused by the large amount of CO₂ released by the vehicles, and the continuous stress of drivers who must drive in often narrow and very busy roads and who must look for a long time to find a space to park. Thus, to solve the parking problem, lot of research is being done on smart parking management system mechanisms. The existing system gives us the information about the empty slots availability but does not give information about the exact location of parking slot available in such a big area. This paper proposes an efficient, cost effective smart car Parking System on wireless Sensor Networks (WSN) technology using LabView that can easily locate and secure a vacant parking space at any car park deemed convenient to them. The parking slots are continuously monitored, and data is continuously updated in the display board.

Index terms

parking system, smart parking, IR sensor

A Complete Monitor to Shishu

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Abstract

It is very important for a parent or guardian to monitor a new born / infant every moment. Monitoring includes the checking if the infant is safe in the placed environment, actions that infants do etc. But it is difficult and also regarded as impossible in the real world, but the requirement of constant monitoring of the infant is never down. Sudden Infant Death Syndrome, also known as SIDS, is the leading cause of mortality in infants from one month to one year of age. Rural as well as urban areas high probably lack the capabilities to help shorten the response time of SIDS cases. In worldwide there are four million babies die in the first month of their birth, one million die on their first day. Now-a-days at least 25% of neonatal deaths happen because of preterm birth also.

An incubator is the one which is used in the hospitals to protect the premature babies, who are extra vulnerable and are at increased risk of complications from infection, noise and light. It may even provide humidified air to help very premature babies to maintain skin integrity. The hospitals in rural areas can't have such facilities to protect the preemies. And, the sad part is many tender lives are lost due to lack of this facility.

This project is for video – based baby monitoring system with Internet of Things (IoT).In the event that abnormal movement is detected from the baby an alarm will be generated to notify the parents or guardians. Monitoring the baby health parameters like temperature, pulse rate and moisture and also for storing the measured values in cloud with appropriate security. The major critical parameters are measured in real time. If any variation from the threshold level, it automatically sends an alert message to the caretaker and do the necessary action immediately to safeguard the children. Advantages are increased response time of the guardian in emergencies, monitoring the environment in which the infant is placed, keeping track of the actions infants do, notifying when an abnormal action detected to respond, low cost baby health monitoring system helps to overcome the inhibitive cost of existing baby incubator.

Real Time Face-Mask Detection Using Haar Feature Based Cascade Classifier

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Abstract

In the context of a transmissible by sputtering virus, it appears necessary to wear masks to protect the wearer and to limit the disease's spread. Coronavirus disease2019 (COVID-19) is a first symptom like infectious disease. COVID-19 first appeared in China, then spread rapidly to the rest of the world. The COVID-19 contagiousity is considered to be high compared to the flu. In this project, a face mask recognition model that captures in real time if a person is wearing a face mask or not. Such models can be particularly useful for security purposes in checking if the disease transmission is being kept in check.

This method is completely based on the object detection and classification of an objects in the image. The core of this Face mask detection model is MobileNet V2 CNN architecture. By the training the MobileNet V2 CNN architecture to detect and classify the objects in the captured scene which will be done by the webcam or any other cameras interfaced to the model.

This method uses two datasets named as “with_mask” and “without_mask” which are consisting of different images of people with and without wearing face masks to train in order to detect key facial features and apply a decision-making algorithm. After creating the proper datasets to train the CNN, then the CNN will recognize the objects and classify the objects in the image. The results of implementing this model demonstrates this method's ability in validating the proper wearing of masks. Showing the results with a bounding box along with the efficiency of wearing mask and not wearing the mask.

Compact EBG Antenna for WiFi Applications

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Abstract

This paper presents an inset fed rectangular micro strip patch antenna with different EBG structure designed for Wi-Fi applications. Two dimensional (2D) Electromagnetic Band Gap (EBG) structures are proposed on the ground plane to get more gain and bandwidth. The effect of EBG structures on the performance of the antenna is investigated. Triangle and Hexagon shaped EBG structures are placed on the ground plane in order to reduce the surface wave propagation. First the rectangular patch is designed with a resonant frequency of 5.2GHz then EBG structures are placed on the ground plane. Simulations have been carried out to verify the performance of all the antennas. All the simulation are done by using High Frequency Structure Simulator (HFSS). As a result of combining the rectangular patch with EBG structure, the bandwidth of the antenna has been increased by 50%. Parameters like S11 (Return losses), VSWR and gain are improved significantly.

A Survey on Autism Spectrum Disorder Recognition Techniques

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Abstract

Human beings can express their emotions through various ways, such as facial expression, bodily expressions, or language. Autism Spectrum Disorder (ASD) is a kind of neurological developmental disorder characterized by its reduced ability that affects the social interaction, language (or) behavioral skills of children. This tends to engage in repetitive and stereotypic behaviors. The underlying causes of ASD are still not well understood but an alarming number of children are diagnosed and suffered from this disorder in the world today. Early Intervention of the disorder is the most important factor which plays a key role in treating the kids with ASD. Various techniques which include Image Processing, Speech Recognition, Behavioral Analysis are used in identifying the children with ASD at early stages. Image Processing is used to Identify the presence of Autism through facial images by providing extensive training to the machine learning models. Speech recognition, questionnaires and behavioral therapies are used for diagnosing the disorder and its severity at various levels.

This paper describes the survey of various Autism recognition techniques and their major contributions in identifying and analyzing the severity of the disorder in children, their performance, and the scope of improvement for further research.

Design and Analysis of Two Stage Operational Amplifier for IoT and Sensor Networks

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Abstract

The key purpose of this paper is to implement an amplifier that retains less power and large gain which is appropriate for precise sensor networks as well as IoT applications. The circuit design of a two-stage opamp is executed with the help of Ltspice tools employing 180-nanometer technology files. Numerous analog systems for example filters, integrators, data converters like ADC's, and summing circuits are carried out with operational amplifiers as it is the most necessary building block for the above-mentioned circuits. It is essential to design an effective amplifier that enhances the performance of analog circuits. Present work largely focused on executing a two-stage opamp with maximum gain. Further, utilizing this two-stage opamp, an instrumentation amplifier is realized. Several performance parameters for example voltage gain, AC gain, slew rate, and bandwidth are calculated and observed.

Index terms

voltage gain, bandwidth, slewrate

Control of External Devices with Thoughts by Using BCI (Brain Computer Interface) for IoT-EEG Calibration System

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Abstract

A Brain Computer Interface (BCI) is a device that translates neuronal information into commands capable of controlling external software or hardware such as a computer or robotic arm. Brain computer interface (BCI) is used in the treatment of neurological disorders and thus helps in the restoration of sensory and motor functions.

BCIs are often used as assisted living devices for individuals suffering with motor or sensory impairments. BCI devices are of two types: invasive and non-invasive. There are a wide range of non-invasive BCI headset devices that typically use Electroencephalography (EEG), Functional Magnetic Resonance Imaging (fMRI) and Magnetoencephalography (MEG) for monitoring and measuring brain activity. All the existing devices lack an efficient way to train mental commands, maintain different human brain profiles, and a standard way to integrate with IoT devices.

Brain-computer interface software for EEG headsets is developed which helps in training mental commands with calibration and provides easy integration with IoT devices. Further it can be enhanced by including REST API Services. The BCI software offers an interface which can accurately classify the signals of the brain using advanced techniques from machine learning and deep learning domains. The person will be able to control external devices with his thoughts. The EEG headset is used to capture the brain waves of the person (signal acquisition phase) and then it is processed using a machine learning model to classify and interpret it. (in signal processing phase).

Index terms

BCI, Electroencephalography, REST (Representational State Transfer) API services, Neurological disorder

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