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Author Name: Sangita S Gambhir, Dr Jatin Majithia

(Semester I, First Year Engineering, Savitribai Phule Pune University)

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Computing Technologies and Applications

Edited By Latesh Malik, Sandhya Arora, Urmila Shrowankar, Vivek Deshpande

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Graph of Words Model for Natural Language Processing

By *Sharayu Mirasdar, Mangesh Bedekar*

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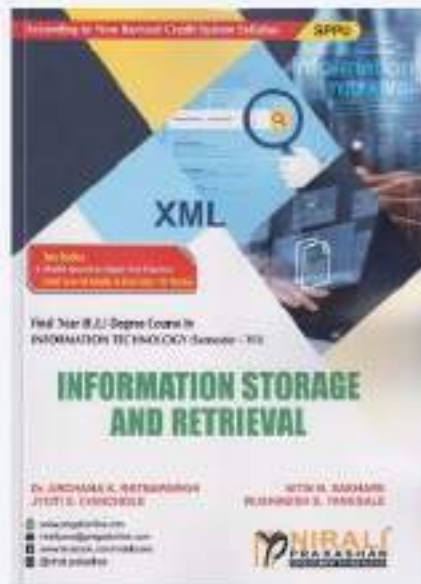
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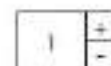
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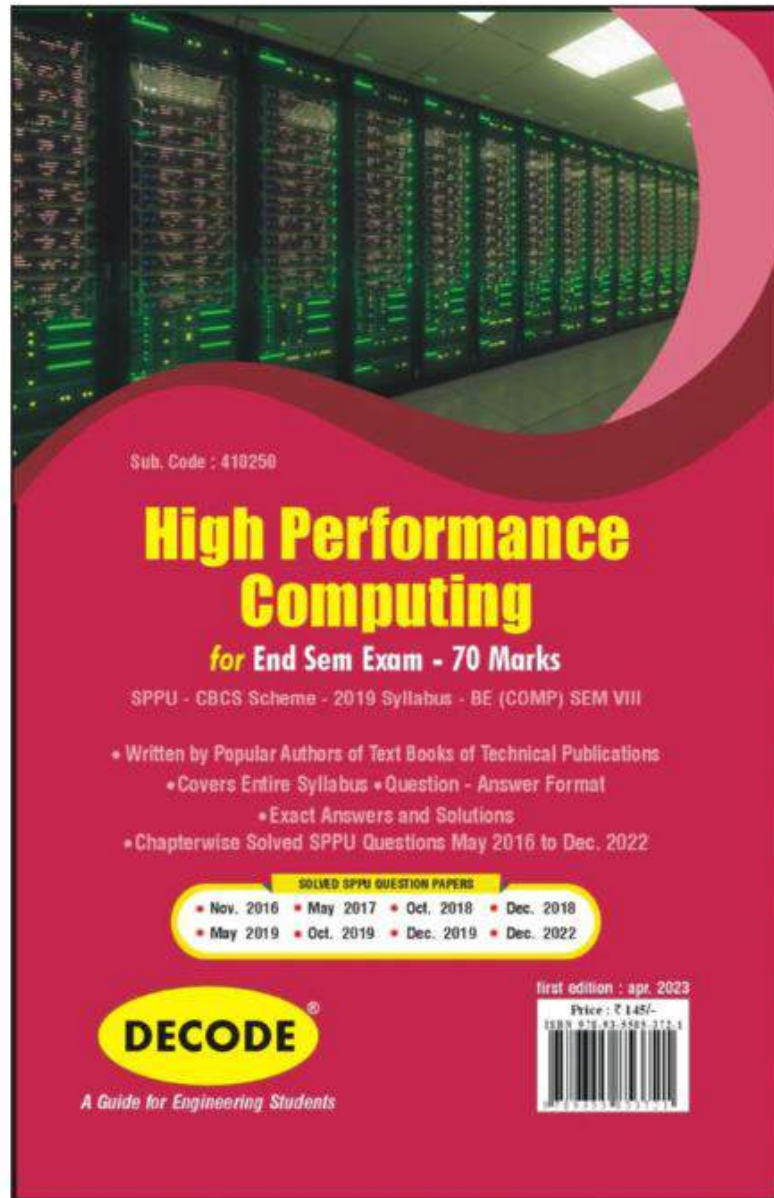
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Color Feature Extraction-Based Near-Duplicate Video Retrieval

Dhanashree Phalke  & Sunita JahirabadkarConference paper | [First Online: 01 October 2022](#)

343 Accesses

Part of the [Smart Innovation, Systems and Technologies](#) book series (SIST, volume 311)

Abstract

Near-duplicate-video retrieval (NDVR) is the systematic approach to search near-duplicate videos. Near-duplicate videos are the videos which may differ from each other as per the format, version, editing differences, etc. Using the RGB color features, the vector is generated which is used for retrieval of NDVR based on Euclidean distance. The performance measure precision is used for the verification of the performance of the model. The benchmarked dataset CC_WEB_VIDEO is used.

Keywords

Near-duplicate video retrieval

RGB

KeyFrame

Euclidean distance

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Survey on Precision Agriculture in Indian Context for Effective Fertigation Using Learning Techniques

Bhavwan Dinkar Therasi & Sunita A. Jahirabekker

Conference paper | [First Online: 12 July 2022](#)

353 Accesses

Part of the [Lecture Notes in Networks and Systems](#) book series (LNNS, volume 464)

Abstract

The biggest issues found in fostering economic potential and yield value of precision agriculture is intelligence because of this we are not able to apply innovative techniques to complete variety of task online and offline. As agriculture affects long chain of supply management from crop production till its delivery to end user, it can be seen as field witch is going to produce high number of jobs. As India's economy is hugely depend upon the field of agriculture there is need to includes technology due to which it should be able to increase its 15.40% share of total crop production at the global level. Therefore, the need for an hour is to optimize the output per unit drop of water. Therefore, in today's sense, great emphasis is put on enhancing irrigation practices in order to increase crop production and preserve productivity levels. Use of advanced fertilizer irrigation system is going to strengthen root of the current agricultural system. The reduction in water usage due to the drip irrigation system varies from 30 to 70% for the surface irrigation method and the productivity benefit ranges from 20 to 80% for the various crops. Fertigation is a process of delivering water soluble fertilizer at the time of irrigation. Use of the fertigation process is going to significantly reduce the work load of the farmers and will save huge amount of time. Fertigation enables the placement of NPK nutrients directly into the plant root zone at the necessary dose during critical times. It is possible to increase crop yield capacity by three times more with the same amount of water by incorporating drip fertigation. Application all the above techniques will help in the process of quality and the production enhancement of the yield.

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Optimal and Event Driven Adaptive Fault Diagnosis for Arbitrary Network

[Pradnya Chaudhari](#) , [Aniusha Joshi](#), [Supriya Kelkar](#), [Anupama Joshi](#) & [Soniya Durgude](#)

Conference paper | [First Online: 23 July 2023](#)

154 Accesses

Part of the [Communications in Computer and Information Science](#) book series (CCIS, volume 1848)

Abstract

Distributed computing system consists of numerous nodes that run as a single system. However, failures in nodes are unavoidable, which results in a node being marked as faulty. The system's performance is impacted by these failures. So, fault diagnosis is a crucial part of the distributed computing system. This paper proposes a new algorithm called Optimal and Event Driven Adaptive Fault Diagnosis in Distributed System (OED-AFD) to identify faulty nodes in the system. This algorithm discovers the dynamic network along with detecting faulty nodes. The algorithm ensures that every node knows the status of all the nodes in the system at the end of every diagnostic cycle. The proposed algorithm is initiated either periodically or when an event, such as a new node entry or a repaired node re-entry is detected by the existing nodes of the system. The laboratory observations indicate that the proposed algorithm discovers and diagnoses any arbitrary distributed system using a minimal number of messages as compared to algorithms and methods proposed earlier by the authors.

Keywords

- Fault detection
- Fault diagnosis
- Arbitrary network
- Adaptive algorithm
- Distributed system
- Distributed network
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AI-Based Digital Technologies in Smart Universities

By *Anamika Kumari, Seema Rajput, Anita Jain, Santosh Kumar*

Book [Advancements in Artificial Intelligence, Blockchain Technology, and IoT in Higher Education](#)

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ABSTRACT

Artificial Intelligence (AI) is an integral part of the making of smart universities, and even the smallest part of the campus uses it to modify their work. AI is everywhere used to give a personalized approach; in universities, it contributes to providing personalization wherever possible. This chapter deals with the contribution of AI in transforming universities into smart ones and how the process has galloped during the period of the Corona Pandemic. AI has facilitated the improvement of the campus overall working, and its utilization has brought significant change in the working of the entire university system. A university comprises infrastructure, education, and research, and AI has helped bring a significant difference. It brings ease, comfort, and efficiency to the teaching and learning part of the system. This chapter is intended to understand the improvement that AI has made in making universities smart.

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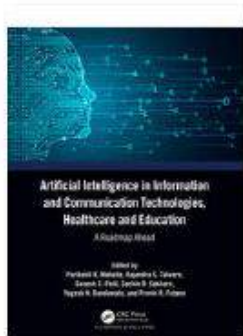
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Credit Card Fraud Detection using Bagging and Boosting Algorithm

Publisher: IEEE

[Cite This](#)[PDF](#)Kanishka R. Deogade ; Dhanashree B. Thorat ; Snehal V. Kale ; Seema Rajput  ; Harjeet Kaur  [All Authors](#)

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Abstract:

In the era of continuously evolving technology and increasing number of credit card holders it has become necessary to find techniques to detect fraud transactions. This problem can be tackled with data science and machine learning. This project aims to build a model that can efficiently classify fraud and non-fraud transactions. After training the sample data set by the model, this model can be further used to detect whether new transactions are fraud or not. Our objective here is to detect fraud transactions with maximum accuracy and to reduce the incorrect classification of transactions. Fraud detection is a classification problem in machine learning. We have focused on analyzing and preprocessing the data set. Further the data is trained using classification algorithms like Random Forest, which is a Bagging based algorithm and Adaboost and XGBoost which are Boosting based algorithms.

Published in: [2022 International Conference on Signal and Information Processing \(IConSIP\)](#)**Date of Conference:** 26-27 August 2022**INSPEC Accession Number:** 22513552**Date Added to IEEE Xplore:** 12 January 2023**DOI:** [10.1109/IConSIP49665.2022.10007446](#)**► ISBN Information:****Publisher:** IEEE**Conference Location:** Pune, India

Deep Learning Based BCI For Enhancing Quality of Life of Senior Citizens

Publisher: IEEE

Cite This

PDF

Rupali Pawar; Prachi Mukherji [All Authors](#)

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- I. Introduction
- II. Existing Approaches
- III. Materials and Methods
- IV. Results and Discussion
- VII. Conclusion and Future Scope

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Abstract:

Brain Computer Interface (BCI) reveals connection between the human brain and computers. The BCI reads the brain waves at different head locations using electrodes and converts them into actions and commands which are used further to control the computers or devices. We propose here a Deep Learning based BCI for enhancing quality of life of senior citizens. The smart, data driven system introduced here is especially useful for assisting elderly people having difficulty to interact with surrounding peripherals. The proposed system consists of two parts: an EEG processing program and microcontroller board. The digitally stored EEG recordings are used for training and testing of classifier. The accuracy of ANN model is compared with CNN model. Accuracy by CNN model is 98.3% whereas by ANN model is 66%. The classifier output can be used to switch on/off a device with the help of a calling function and a suitable controller.

Published in: [2022 International Conference on Signal and Information Processing \(IConSIP\)](#)

Date of Conference: 26-27 August 2022

INSPEC Accession Number: 22513611

Date Added to IEEE *Xplore*: 12 January 2023

DOI: [10.1109/IConSIP49665.2022.10007439](#)

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Publisher: IEEE

Conference Location: Pune, India

I. Introduction

People experience various health related issues with aging. There is an increasing tendency of dependence with age. Multidisciplinary approaches are coming forward as a solution for aging and the related issues in daily living. Assistive technologies help to better perform daily routine. BCI works as an assistive, adaptive, and rehabilitative technology functioning on brain originated signals which reflect the intent of a person into commands that control the device. Different brain conditions are resulting in creation of varied patterns of neural signals. These signals are differentiated on the basis of amplitude and frequencies. The model is trained on these signals. The pre-processing and feature extraction steps are applied and the extracted features are fed to the classifier. The classification accuracy of ANN and GNN deep learning models is compared. It is found that CNN model performs better compared to ANN model. The classifier output

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A Deep Learning Framework for Real-Time Indian Sign Language Gesture Recognition and Translation to Text and Audio

Ashwini M. Deshpande, Gayatri Inamdar, Riddhi Kankaria & Siddhi Katage

Conference paper | First Online: 22 September 2022

241 Accesses

Part of the [Lecture Notes in Networks and Systems](#) book series (LNNS, volume 428)

Abstract

Indian Sign Language (ISL) is used in the deaf community all over India. Development of the ISL recognition system is an active area to aid this community. In ISL, most of the signs are two-handed signs, and thus, it differs from another commonly used American Sign Language (ASL) and seems complex. In this paper, the design and implementation of a system to recognize ISL signs is reported. Building such a system can help specially abled person/people, by providing a medium to communicate with others without human interpreters. The proposed system is built using a deep convolutional neural network (CNN), which performs both feature extraction and classification, preceded by an image preprocessing step. A real-time input (live signs captured from webcam) is given to this system, and the output is delivered in the form of text and audio. Proposed CNN architecture has achieved an accuracy of 98% for a given dataset which comprises 56 items (1–10 digits, A-Z letters, and 20 general words).

Keywords

- Hand gestures
- Indian Sign Language
- Contouring
- Segmentation
- Convolutional neural network

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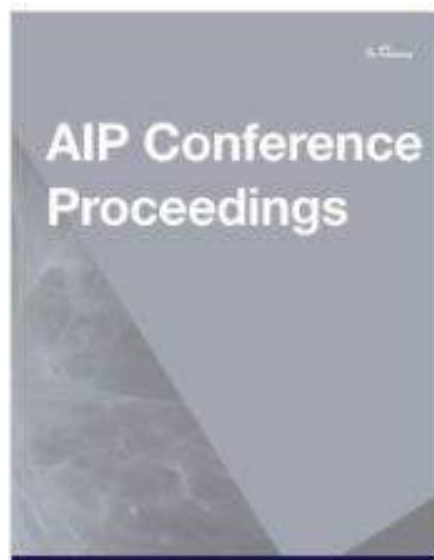
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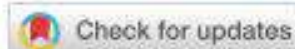
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RESEARCH ARTICLE | OCTOBER 31 2022

Machine learning based sentiment analysis of Twitter data

Shivani Lad; Gargi Mane; Apurva Padwal ; Mrudul Dixit[+ Author & Article Information](#)

AIP Conf. Proc. 2494, 050007 (2022)

<https://doi.org/10.1063/5.0111007>

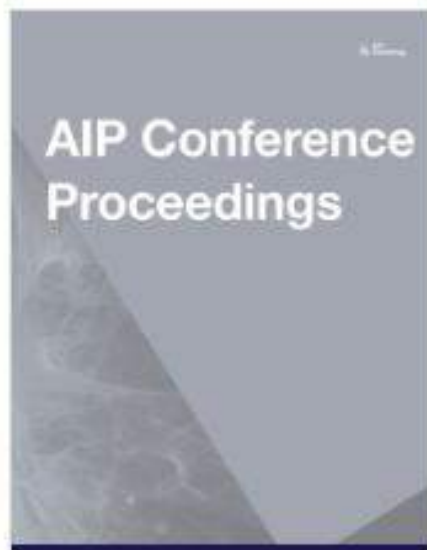
During this project, we intend to determine and categorize opinions from tweets and additionally confirm which ML classifier is best for the classification method. Social media provides a chance for businesses by giving a platform to connect with their customers for advertising. Micro-blogging platforms for example Twitter are widely being used for several years as of now. Through implementation of sentiment analysis, positive, negative and neutral are the categories into which tweets are classified. A comparison of machine learning classification algorithms like Naive Bayes, SVM, RF and KNN is enforced.

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[Machine learning](#)

Volume 2494, Issue 1

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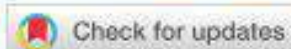
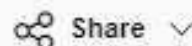
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RESEARCH ARTICLE | OCTOBER 31 2022

Hand gesture recognition using deep learning

Gayatri Amrutkar; Manasi Shinde; Kalyani Thattekar ; Mrudul Dixit[+ Author & Article Information](#)*AIP Conf. Proc.* 2494, 050008 (2022)<https://doi.org/10.1063/5.0110700>

The aim of our project is to design system which will be elementary and useful to obtain human-computer interconnection and will provide support to those in necessity by confirming social importance also Deaf & Dumb people could easily communicate with community. The Classical methods have crashed to obtain compatible image descriptors for hand gesture recognition in the present framework because of many challenging elements. Recently come up Deep learning algorithms and developments in CNN exceeds the traditional address towards the hand gesture recognition as it keeps away the standard preprocessing and segmentation steps and automatizes the operation of feature extraction.

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Enhanced Color-Based Marketing With Psychometric And Demographic Data Analysis Using Machine Learning

[Mrudul Dixit](#) , [Bhooshan Kelkar](#), [Madhura Kelkar](#) & [Lakshmi Chandrasekharan](#)

Conference paper | [First Online: 23 July 2023](#)

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Abstract

Various studies have shown that marketing decisions (online and offline) are significantly influenced by the color of the commodity. This paper builds a predictive model for the preference of colors of potential buyers using their demographic and psychometric data. Predicting the color of preference has the potential to increase the propensity of buying as well as up-sell and cross-sell opportunities. This paper deals with prediction of color preference using machine learning models such as K-neighbors, decision tree, multinomial Naive Bayes (MultiNB), support vector classifier (SVC), support vector machines (SVMs), and random forests classifier (RFC). The data set used consists of 2022 individuals with 10 input parameters (demographic and psychometry) and 8 output parameters. (colors). The machine learning models were built and compared on the basis of accuracy.

Keywords

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Comparative Study of Different Models for Language Translation

Publisher: IEEE

[Cite This](#)[PDF](#)Shweta Jagannath Kalyanshetti ; Manjiri Shekhar Jagtap ; Aditi Uday Kale ; Prachi Waghmare [All Authors](#)

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Abstract:

As India is country with diverse culture, there are 22 official languages and many other regional languages. Because of this, it is difficult for people to exchange the ideas and communicate with each other. In Neural Machine Translation (NMT), one language is translated to other which helps to overcome the barrier of language difference. In this paper, we have studied NMT Models to translate English sentences to Marathi. The neural machine translation models on the basis of Recurrent Neural Network (RNN), Long Short-Term Memory (LSTM), Gated Recurrent Units (GRU) are implemented respectively considering the differences in the structure of their networks. Transformer is also implemented after we discover the limitations of the above three basic models which are Long Term Dependency of Words, Exploding Gradient and Vanishing Gradient problem. Common steps followed in all models are Preprocessing, encoding and decoding. After studying all the models, a comparative analysis of models is done based on the Bilingual Evaluation Understudy (BLEU) score where we calculated Unigram(1-gram) and Bigram(2-gram) scores using reference and translated sentences.

Published in: 2022 6th International Conference On Computing, Communication, Control And Automation (ICCUBEA)

Date of Conference: 26-27 August 2022

INSPEC Accession Number: 22540158

Date Added to IEEE Xplore: 16 January 2023

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► **ISBN Information:**

Publisher: IEEE

► **ISSN Information:**

Conference Location: Pune, India

I. Introduction

In the 21st century, due to advancements in technology, the world has come closer than ever before. Thus, communication and information exchange are needed but language is a barrier. Natural Language Processing (NLP) creates a technique that provides the ability for computers to interact with humans. Machine translation is a domain of NLP which helps to remove this barrier of variation in language.

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Atmospheric Image Correction and Removal of Cloud Cover for Satellite Images

Publisher: IEEE

[Cite This](#)[PDF](#)Vaishnavi Kharat ; Sanyukta Khatdeo ; Harshada Kothe ; Rutuja Kshirsagar ; Mrudul Dixit ; M Selva Balan [All Authors](#)

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Abstract

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Abstract:

Accurate atmospheric correction is crucial for surface analysis and environmental monitoring. Adverse weather conditions, such as clouds and haze, often degrade the contrast and fidelity of outdoor images, leading to uncertainties in surface observations. Cloud removal techniques in computer vision and image processing, including recent approaches like Generative Adversarial Networks (GANs), Image Inpainting, and Image Fusion, have been developed to address this challenge. However, these techniques face various challenges, such as limited availability of diverse training data, artifacts introduced in the resulting images, and computational complexity. This paper focuses on the removal of cloud cover and haze in multiband satellite images using the S2 Cloudless dataset and the Dark Channel Prior (DCP) algorithm. An approach is proposed to reconstruct clouded areas and generate cloud-free spatio-temporally continuous images for in-depth time-series analysis. The objective is to enhance the utility of the data by restoring the polluted areas in cloudy satellite imagery. The methods are evaluated using metrics such as Mean Square Error (MSE), Peak Signal-to-Noise Ratio (PSNR), Structural Similarity Index Measure (SSIM), and Average Mean Pixel Value to assess the performance of both the input and output images. The results demonstrate the effectiveness of the methods in improving the quality and utility of cloud-covered satellite imagery, overcoming the challenges posed by limited training data, artifacts, and computational complexity.

Published in: 2023 International Conference on Sustainable Computing and Smart Systems (ICSCSS)

Date of Conference: 14-16 June 2023

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DOI: 10.1109/ICSCSS57650.2023.10169542

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Publisher: IEEE

Conference Location: Coimbatore, India



2024 | OriginalPaper | Book chapters

Adaptive Hybrid Optimization-Based Deep Learning for Epileptic Seizure Prediction

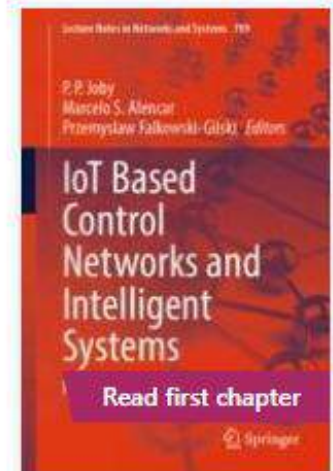
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Published in: [IoT Based Control Networks and Intelligent Systems](#)

Publisher: Springer Nature Singapore

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PUBLISHED IN:



Alphabet Recognition using Air written Trajectories

Publisher: IEEE

[Cite This](#)[PDF](#)Jasmine Karbhari ; Prachi Mukherji [All Authors](#)

48

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Abstract

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Abstract:

The enormous potential use of air-writing recognition in intelligent systems has made it highly popular. Some of the most fundamental issues in isolated writing are yet to be fully addressed. Writing a linguistic character or word in free space using a finger, marker, or handheld device is referred to as a trajectory-based writing method. It can be used where traditional pen-up and pen-down writing techniques are inconvenient. It has a significant upper hand over the gesture-based approach due to its simple writing style. However, because of the diverse characters and writing styles, it is a difficult process. In this paper, an alphabet recognition system for alphabets written in air, where the alphabet is recognised based on air trajectories which are three-dimensional (3D) and gathered by a single camera in this study. A reliable and effective colour-based segmentation is proposed to extract air recorded trajectories gathered by a standard web camera. This solves the problem of push-to-write by removing limits on users' writing without the usage of an illusory box. The trajectory is normalized for improved recognition using convolutional neural network (CNN). We achieve recognition in real time with a high accuracy of 95% and negligible neural network complexity. It beats and surpasses the currently used techniques that involve written images as input.

Published in: [2023 International Conference on Emerging Smart Computing and Informatics \(ESCI\)](#)**Date of Conference:** 01-03 March 2023**INSPEC Accession Number:** 22960634**Date Added to IEEE Xplore:** 19 April 2023**DOI:** [10.1109/ESCI56872.2023.10099805](#)**► ISBN Information:****Publisher:** IEEE**Conference Location:** Pune, India

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| Published online: | 09 August 2023 |

ITM Web of Conferences 56, 02004 (2023)

Land cover clustering and classification of satellite images

Vaishnavi Kharat^{1*}, Sanyukta Khatoleo¹, Harshada Kothe¹, Rutuja Kshirsagar¹, Mrudul Dixit¹ and M. Selva Balan²

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* corresponding author: vaishnavi.kharat@cumminscollage.in

Abstract

Land cover classification refers to the process of using remote sensing data to categorize different types of land cover like vegetation, water bodies and soil. This is helpful for gaining key information about the surface of the Earth and for the future interactions between human activities and the environment. These predicted interactions lead to the development of sustainable land use practices along with the protection of natural resources. This paper deals with classifying the land cover using unsupervised and supervised methods. The unsupervised method includes land cover detection using a K-means clustering algorithm and the supervised classification is done using random forest classifier. The evaluation parameter values are calculated and compared for the input and output images.

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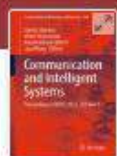
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International Conference on Communication and Intelligent Systems

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Performance Analysis of Neural Machine Translation Models for ASL to ASL Gloss Conversion

[Prachi P. Waghmare](#) & [Ashwini M. Deshpande](#)

Conference paper | [First Online: 11 July 2023](#)

140 Accesses

Part of the [Lecture Notes in Networks and Systems](#) book series (LNNS; volume 689)

Abstract

One of the latest advancements in the domain of machine learning is the translation of sign language into a form of natural language. Numerous studies have concentrated on converting gestures or facial recognition from sign language. This study contributes by employing a deep learning technique for the conversion of English text to American Sign Language (ASL) with the help of neural machine network models. Research on Neural Machine Translation (NMT) architecture has advanced with the advent of the attention mechanism, which is based on queries and keys, the attention network determines the significance of each data vector. In this paper, experimentation is shown using sequential models on the ASLG-PC12 dataset, and Bilingual Evaluation Understudy (BLEU) scores are calculated for the examples from the dataset to evaluate model performance. Results on the ASLG-12 corpus depict that the Gated Recurrent Unit (GRU) model with Bahdanau attention delivers better results with text to gloss translation attempts.

Keywords

ASL

BLEU

Neural machine translation

Natural language processing

Sign language gloss

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Chapter 4

Object Identification in Remotely-Assisted Robotic Surgery Using Fuzzy Inference System

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Pimpri Chinchwad College of Engineering, India

Dipti Durgesh Patil

 <https://orcid.org/0000-0001-7379-863X>

MKSSS's Cummins College of Engineering for Women, Pune, India

ABSTRACT

Although telemedicine is still practiced today, high-speed connections and improved organizational capability have enabled remote operation of medical equipment, known as telerobotic surgery. The technologies have a number of benefits, including enhanced performance and the ability to reach complex operations to geographically isolated places where trained surgeons are unavailable. This study proposed an early robotic solution for limited teleoperation tasks in a complex and unpredictable environment. So, the research is inspired by future human-robot collaboration. It focuses on limiting or preventing accidents between the robot and its environment. In order to enable access to robotic surgery equipment in a confined area, a fuzzy control method is used. We may infer that an adaptive robotic system capable of accomplishing limited tasks while also responding to external factors in an unpredictable and dynamic environment is potentially feasible.

DOI: 10.4018/978-1-6684-3733-9.ch004



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Content-Centric Prediction Model for Early Autism Spectrum Disorder (ASD) Screening in Children

Anita Vikram Shinde[✉] & Dishi D. Patel

Conference paper | First Online: 06 November 2022

340 Accesses | 1 Citations

Part of the [Lecture Notes in Networks and Systems](#) book series (LNNS volume 520)

Abstract

Autism spectrum disorder (ASD) is a severe developmental disorder that impacts the capacity of patient to communicate and interact. Its symptoms are observed in the initial developmental stages and persists entire lifetime. Though the reasons of ASD are in genetics or in environmental factors, still their life can be made better by diagnosing and providing treatment to them at early phase. In present time, scientific medical test carried for ASD diagnosis is not only time-consuming but also costly. Machine learning has shown outstanding results in various domains including health care. In order to enhance the correctness (accuracy) and duration needed for early identification, machine learning methods can be incorporated to balance the traditional usual procedures. The proposed model with machine learning classifiers is applied on our dataset, and predictive model is built using generated results. The key aim of this proposed work is to predict whether the patient is at risk of having ASD which would help in the diagnosis process so that suitable treatment and therapy can be recommended to patients and hence they can live normal lifestyle. By observing the results achieved, it is clear that decision tree provides maximum accuracy on autism dataset.

Keywords

[Autism spectrum disorder \(ASD\)](#) [Machine learning](#) [Healthcare solutions](#)

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Environment-Based Asthma Trigger Detection (ATD)

[Shreya Chourasiya](#) , [Leena Panchal](#), [Madhavi Dangra](#), [Manasi Bhandari](#), [Vaishnavi Charkha](#) & [Isha Dhale](#)

Conference paper | [First Online: 01 November 2022](#)

346 Accesses | 1 [Altmetric](#)

Part of the [Lecture Notes in Networks and Systems](#) book series (LNNS, volume 516)

Abstract

More than 300 million people worldwide suffer from asthma, and around 2 million people die each year as a result of asthma attacks. Asthma can be started and exacerbated by many factors in the environment. The pollutant could act as a trigger if someone suffers from hyper-responsive airways, resulting in an asthma attack. ADT is a realistic approach for detecting asthma triggers which has been presented to aid in the identification of the factors that induce asthma in a certain person. Different gas concentrations have been monitored, and threshold values have been calculated using the standard Air Quality Index (AQI), as a baseline.

Keywords

- Asthma
- Asthma trigger
- Air quality index
- Environmental factor
- Threshold value
- IOT

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ICT Analysis and Applications pp 639–649 | [Cite as](#)

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A Real-Time Driver Drowsiness Detection Using OpenCV, DLib

[Srinidhi Bajaj](#) , [Leena Panchal](#), [Saloni Patil](#), [Krutika Sanas](#), [Harshita Bhatt](#) & [Swapnali Dhakane](#)

Conference paper | [First Online: 06 November 2022](#)

336 Accesses | 2 Citations

Part of the [Lecture Notes in Networks and Systems](#) book series (LNNS, volume 517)

Abstract

Every year thousands of people die around the world in motorway accidents, and one of the main reasons for this is drivers' drowsiness and fatigue. According to a survey by the Central Road Research Institute (CRRI) in 2019, drivers who exhaust themselves doze off, while driving are accountable for about 40% of road mishaps. To reduce the road mishaps, a system to monitor driver's alertness by detecting the visual features of the driver by finding the drowsiness state of the driver is proposed. It deals with an algorithm which considers the frequency of the eye-blink called PERCLOS, that make use of the eye coordinates obtained from Dlib's Haar cascade model to determine eye's state of the driver either open or close and sounds an alarm if the driver is found to be in drowsy state, the warning can be deactivated manually rather than automatically. This algorithm performs better than current drowsiness detection systems in both accuracy as well as speed at adequate lighting conditions. The frames captured of driver are of 640*480 resolution at over 20 fps to determine drowsiness of the driver and give accuracy of 98%. It is also affordable as it does not require any expensive hardware, only a built-in Android camera is required to provide a warning sound when the proposed system predicts that the driver is drowsy. This research result can serve as an important component in ADAS, and it can ensure safety of drivers and minimise financial and personal losses caused by accidents.

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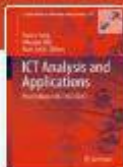
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A Comparative Analysis of Various Techniques of Data Leakage Detection in Different Domains

Kiran Patil , Harsha Sonune, Soniya Devikar, Vrushali Chaudhari & Isha Ayachit

Conference paper | [First Online: 06 November 2022](#)

346 Accesses | 1 Citations

Part of the [Lecture Notes in Networks and Systems](#) book series (LNNS, volume 517)

Abstract

With the steep growth in information technology and its global reach, as well as the common citizen's ever-increasing reliance on technology, data privacy and security have become a major source of concern for individuals all over the world. In today's era, computing devices like virtual servers, databases, physical servers, databases, and many more devices are occupied with confidential data. This paper is an exploratory case study that analyzes the various algorithms and methods proposed across the various domains, and a comparative analysis was done.

Keywords

- Data leakage detection
- Android
- Networking
- Cloud computing
- Machine learning
- Guilty agent
- Privacy
- Watermark
- Fake object
- Bigraph

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Advances in Vision-Based UAV Manoeuvring Techniques

[Bhakti Chindhe](#), [Archana Ramalingam](#), [Shravani Chavan](#), [Shreya Hardas](#) & [Dipti Patil](#)

Conference paper | [First Online: 05 April 2023](#)

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Part of the [Smart Innovation, Systems and Technologies](#) book series (SIST, volume 333)

Abstract

In recent years, there has been significant growth in applications of Unmanned Aerial Vehicles (UAVs). The demand for an autonomous UAV navigation is growing due to various applications in GPS-denied environments like disaster relief monitoring, search and rescue, mining, bridge inspections, space explorations, and military activities. Visual measurements possess a lot of accurate information which is extracted and exploited for UAV manoeuvring. This paper presents a comprehensive survey of vision-based UAV manoeuvring techniques. The approaches range from deep learning, digital elevation map, and optical flow to mathematical models. The outputs of these techniques cover the various aspects of autonomous navigation like velocity, thrust, yaw angle, heading angle, position, and height. The paper encompasses methods for both indoor and outdoor navigation. The techniques covered manage smooth UAV navigation in different and even unfavourable illumination conditions. Furthermore, this paper serves as a medium to gain insight into the essential aspects of drone navigation methods and their applications.

Keywords

- UAV
- Autonomous
- Vision-based
- Deep learning
- Optical flow
- Manoeuvring
- Digital elevation map

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Study of NFT Marketplace in the Metaverse

[Isha Deshpande](#) ✉, [Rutuja Sangitrao](#) & [Leena Panchal](#)

Conference paper | [First Online: 29 May 2023](#)

305 Accesses | 2 Citations

Part of the [Lecture Notes in Networks and Systems](#) book series (LNNS, volume 662)

Abstract

The metaverse has opened up the next door in digital evolution. It has the ability to expand the domain of online services by providing a life-like online experience. The digital experience is powered by blockchain technology, tokenomics, and decentralization. The non-fungible token (NFT) is a unique token on the blockchain that is traded, bought, and sold on various NFT marketplaces. NFT marketplaces can also be curated in the metaverse, providing a more interactive experience. Key concepts and principles regarding metaverse, blockchain, decentralized applications, and user experience have been studied, and a recipe to understand and create a metaverse NFT marketplace has been presented in this paper.

Keywords

- Blockchain
- Metaverse
- Digital twins
- Non-fungible tokens (NFT)
- NFT marketplace
- Decentralized application (DApps)
- Metaverse index
- Tokenization

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Pix2Pix Generative Adversarial Network with ResNet for Document Image Denoising

Publisher: IEEE

[Cite This](#)[PDF](#)Pranjal Jadhav ; Mayuree Sawal ; Anushka Zagade ; Prema Kamble ; Prajakta Deshpande [All Authors](#)

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Abstract

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Abstract:

Noise degrades quality of scanned document images and adversely affects the accuracy of document digitization and text extraction tasks such as optical character recognition (OCR). Denoising and quality enhancement is the preprocessing stage of the processing pipeline in OCR. This research work proposes an effective end-to-end framework that uses the pre-trained pix2pix Generative Adversarial Network (GAN) to denoise degraded electronic document images. To increase the capacity of the generator network, a variation of the baseline model is developed by replacing the U-net architecture with ResNet6. Along with the discriminator patchGAN in pix2pix model, a pipeline has been developed to extract the patches from input images, predict clean patches using the trained model and finally merge the output patches smoothly. For training, a noisy scanned document dataset created by synthetically adding noises has been utilized to clean the images. Finally, the proposed model is tested by performing quantitative analysis based on different metrics - Structural Similarity Index Measure (SSIM) and Peak Signal to Noise Ratio (PSNR) as well as qualitative analysis by using OCR test on test dataset and real-time documents.

Published in: 2022 4th International Conference on Inventive Research in Computing Applications (ICIRCA)

Date of Conference: 21-23 September 2022

INSPEC Accession Number: 22473560

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DOI: 10.1109/ICIRCA54612.2022.9985695

► ISBN Information:

Publisher: IEEE

Conference Location: Coimbatore, India



ICT Infrastructure and Computing pp 603–611 | [Cite as](#)

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Patch-Based Autoencoder for Document Image Denoising with Smoothing

[Sawal Mayuree](#) , [Zagade Anushka](#), [Jadhav Pranjal](#), [Kamble Prema](#) & [Deshpande Prajakta](#)

Conference paper | [First Online: 08 November 2022](#)

351 Accesses

Part of the [Lecture Notes in Networks and Systems](#) book series (LNN5, volume 520)

Abstract

Documents can be stored in digital formats permanently thanks to the ease of digitization. While scanning or capturing documents, noises such as low resolution, printing noise, and compression noise might be introduced. Noise has a negative impact on document analysis activities such as OCR and text identification. Denoising and restoration of noisy scanned document images are a classical image processing problem that aims to eliminate such type of artifacts from given noisy images. We propose a novel deep learning pipeline for denoising followed by smoothing, ultimately enhancing the quality of scanned documents images. We train an end-to-end patch-based convolutional autoencoder network along with ResNet skip connections. We introduce a noisy-clean paired dataset by synthetically adding noises to corresponding clean images. Our model is shown to effectively remove both physical noises like coffee stains and pencil scribbles, as well as digitally introduced noises like printer noise, compression noise, and low resolution, among others.

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Troomate—Finding a Perfect Roommate a Literature Survey

Aditi Romate, Anshu Dubey, Rutuja Dhanraj, Snehti Chidambhar  & Prajakta DeshpandeConference paper | [First Online: 29 May 2023](#)

267 Accesses

Part of the [Lecture Notes in Networks and Systems](#) book series (LNNVS, volume 662)

Abstract

When someone arrives at a new place, the first thing that they do is look for a place to dwell, and when the company they are with is not appropriate, it leads to disputes and sometimes shifting to a new place which can be very tedious. Finding the right roommate is very important as it affects the physical and mental health of a being. The present solutions in the market for this problem include websites like roomster.com, olx.in, indianroommates.in, etc., and applications like FlatMatch, Roomster, etc. A detailed analysis of potential competition was done in order to figure out our standing among them. The paper analyzes them on the basis of their features, ratings from users, etc. Roommate-finding platforms exist, but they just display a list of users without considering their preferences. This is where Troomate has an advantage. A detailed literature survey was done about how the pairing of people could be done based on their idea of the perfect roommate. This paper includes various algorithms like Gale–Shapley, Elo rating score, and techniques like clustering in order to effectively match on the basis of powerful filters like social traits, diet habits, sleeping schedules, etc. With an interactive, well-designed UI, dependable backend, and reliable algorithms, Troomate aims at solving the problem effectively.

Keywords

Roommate finder

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Graphology-Based Behavior Prediction: Case Study Analysis

[Iresha Deshmukh](#) [Prachiya Borewal](#), [Aboli Khursale](#), [Neha Lohare](#) & [Harsha Sonune](#)

Conference paper | [First Online: 29 May 2023](#)

272 Accesses

Part of the [Lecture Notes in Networks and Systems](#) book series (LNNS, volume 662)

Abstract

The handwriting of a human being carries the richest information which helps gain insights into one's physical, emotional, and mental state. Graphology helps in interpreting a person's characteristics by analyzing their handwriting. It is the investigation of a sensible state of mind at the time of writing. This gives an insight into the morality, enthusiasm, and hidden talent of the writer. The state of the cerebrum is reflected in handwriting as the signals move from the cerebrum to the fingers. This has been studied for almost 400 years. Graphology has wide applications in the field of medicine, education, criminology, etc. Integrative graphology primarily focuses on different strokes of the written word and the relation to an individual's personality. Holistic graphology considers the form, use of space, and movement during writing. Features of handwriting such as concavity of letters, margin, spacing, pen pressure, baseline, size of letters, loops of alphabets are considered for the above-mentioned applications. These factors lead to the analysis and study of cases based on criminology and depression which focuses on examining the handwriting of the individual and keep a track of their behavior.

Keywords

[Graphology](#) [Handwriting analysis](#) [Characteristic traits](#) [Personality](#)
[Image processing](#) [Feature extraction](#) [Classifications](#) [Machine learning](#)

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[Data Intelligence and Cognitive Informatics](#) pp 27–38 | [Cite as](#)

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Statistical Analysis of Stress Prediction from Speech Signatures

[Radhika Kulkarni](#) , [Utkarsha Gaware](#) & [Revati Shriram](#)

Conference paper | [First Online: 03 December 2022](#)

440 Accesses

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

Abstract

Stress is a natural physical and psychological response to life's events. It can be triggered because of being under lots of pressure, having responsibilities that you are finding overwhelming, not having much or any control over the outcome of a situation and times of uncertainty. The elevated levels of stress hormones and blood pressure, as well as the continuous and ongoing increase in heart rate, can have an impact on daily living and well-being. This type of long-term stress can put you at risk for high blood pressure, stroke, or heart attack. To avoid this, modern technology can be used to develop tools that can alert people to their rising stress levels, preventing long-term injury to the body. Stress has an effect on a number of physiological factors that can be examined in order to detect it effectively. The study of forecasting people's mental states from their voice in stressful and non-stressful situations is known as voice analysis, as well as investigating how the voice changes in stressful situations in humans. The goal of this research is to use speech signals to predict stress. In MATLAB, several spectral properties from voice are retrieved. The gathered results are subjected to statistical analysis in order to arrive at a more accurate conclusion.

Keywords

Stress Speech Spectral features Voice analysis Statistical analysis

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Advances in Signal Processing and Communication Engineering pp 287–294 | [Cite as](#)

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EEG Signal Analysis During Stroop Task for Checking the Effect of Sleep Deprivation

[Bhagyashree Naxchede](#) [Sai Kate](#), [Vaishnavi Melkapore](#) & [Revati Shrinani](#)

Conference paper | [First Online: 02 December 2022](#)

230 Accesses

Part of the [Lecture Notes in Electrical Engineering](#) book series (LNEE, volume 929)

Abstract

Studies suggest that eight hours of sleep is important for the brain to function properly. Sleep deprivation may affect individual's health and cognitive ability. In this project, we studied how cognitive ability is affected by sleep deprivation. For this, the Stroop test was used which is based on the color word incongruency. Congruent word is word written in same color ink, and incongruent word is word written in different color ink. For our project, three different Stroop test, namely English, Hindi, and Animal, are used. The animal Stroop task is a picture Stroop task. Here, two animals will be displayed on the screen. Congruent is when the animal bigger in real life is shown bigger and incongruent is when animal smaller in real life is shown bigger on the screen. All three tests had eleven stages with the incongruency increasing with each stage. To analyze the difference in the brain functioning and the performance of the Stroop test both sleep deprived and non-sleep deprived individuals were considered in this study. A base EEG in relaxed stage was also taken before the test to compare each subjects signal with his/her relaxed state reading. To analyze the results, detrended fluctuation analysis, Higuchi fractal dimension, entropy, Kolmogorov complexity, and Lyapunov exponent of the EEG signal were studied using MATLAB. Using these features, we were able to analyze the difference in brain functioning of sleep deprived and non-sleep deprived individuals. The reaction time of the test was used to comment on whether sleep deprivation affects cognitive performance. For this project, equal contribution was made by all the contributing authors.

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↳ CIS 2022: [Third Congress on Intelligent Systems](#) pp 667–681 | [Cite as](#)

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IoT-Based Automotive Collision Avoidance and Safety System for Vehicles

[Dipali Ramdas](#), [Lokita Bhoje](#), [Binita Jiby](#), [Hrithika Pembarti](#) & [Sakshi Phadatare](#)

Conference paper | [First Online: 19 May 2023](#)

167 Accesses

Part of the [Lecture Notes in Networks and Systems](#) book series (LNNS, volume 613)

Abstract

Road accidents claim over a million lives every year. Some of the causes of these accidents are poor visibility of roads, false estimation of nearby vehicles and delay of driver to hit the brake. The developed IoT-based system focuses on reduction of accidents by addressing these causes. It alerts the driver about the presence of humps and potholes on the road by detecting it in advance. The visual alerts are provided by various coloured LEDs and the audio alert is provided using voice communication. The system also measures distance between the host vehicle and the vehicle ahead to maintain a safe distance of 400 m and warns the driver if safe distance is not maintained. This feature also helps in avoiding collisions with other vehicles and unidentified objects. In the worst-case scenario, if an accident occurs, this system tracks the vehicle's geographical location and provides a message alert to the registered emergency contacts. The system is equipped with vehicle-to-vehicle communication for data transmission amongst vehicles using Li-Fi technology. The range of this V2V communication is up to 2–3 m. With this feature, the host vehicle can transmit information about emergency brake situations and presence of emergency service vehicles in the vicinity for clearing the driving path. Audio and visual mechanisms are employed for alerting the driver. The system is developed by incorporating ultrasonic sensors with Arduino for testing purposes. Every feature of the system is tested with real vehicles in simulated circumstances. The performance of the system is satisfactory in all test environments.

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Smart Sensors Measurement and Instrumentation pp 129–137 | [Cite as](#)

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Oil Quality Analysis Using Image Processing

[Nivedita Daimiwal](#) , [Revati Shriram](#), [Harish Shinde](#), [Radhika Kulkarni](#) & [Apeksha Galewad](#)

Conference paper | [First Online: 12 March 2023](#)

258 Accesses

Part of the [Lecture Notes in Electrical Engineering](#) book series (LNEE, volume 957)

Abstract

Now-a-days, people are demanding good quality of cooking oil (edible oil). For a healthy heart, quality of cooking oil we consume plays a very important role. As the cost of good quality cooking oil is more, there is a possibility of adulteration of oil by the traders. FSSAI also decided to crack down on the sale of adulterated edible oil. The campaign was made by FSSAI all over India in August 2020. But, the test results are expected in a month's time. The aim of the project is to determine the change in various parameters of an oil based on the presence of adulterants or some other oil residues. Determination of the presence of adulterants would be helpful in avoiding many health conditions. Changing the ratios of the oils in the mixture can show a change in the parameters that are being measured as the chemical contents of the oils are changed. The objective is to design a system to detect the adulteration and its percentage using machine learning method in various types of oil using oil image. So, the initiative is made to develop a machine learning image processing system. In this method, oil images were used to detect the adulteration in the oil. Features are collected for different ratios of adulteration, and these features obtained by image processing are used for detection of adulteration and its percentage. Variation in the features like RGB, mean, variance and entropy is measured and plotted in Minitab for various percentage of adulterations.

Keywords

Pure groundnut (wooden pressed edible oil)

Refined oil (chemically treated)

Quality

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Posture Monitoring Apparatus For Physiotherapy

Publisher: IEEE

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Kalyani Dalvi ; Shruti Dalvi ; Anagha Panditrao ; Sharvari Deshpande ; Aradhana Bakare [All Authors](#)

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- II. Methodology
- III. System Design
- IV. Experimentation and Result
- V. Conclusion

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Abstract:

The recent advancement in technology is leading to the emergence of a new lifestyle. Even though people are being assisted by devices from even small tasks in daily work has made the lifestyle easier but has also caused a reduction in daily activities and movements causing adverse health effects. Physiotherapy is a healthcare profession that is concerned with the functioning of humans and one's movement which will maximize the physical potential of the body. Monitoring the physical movements of the body is generally not easy but if it comes to monitoring movements of the muscles joints or spines it is very difficult without straining the body. Based on the physical conditions of the patients the physiotherapist suggests exercises that will help them to reduce the pain. The physiotherapist uses traditional methods like goniometry in which the angle between the joints is measured to analyze the pain in the muscles or joints. Also, they use the gait analysis method to analyze the balance in the body. Based on the analysis they suggest necessary exercises which are mandatory to monitor at home in order to reduce unnecessary straining of muscles. So we have proposed a solution which is a system that will monitor the exercises done at home with data provided by physiotherapy at once. The system will take the data of the exercise which were performed in front of the physiotherapist and this data will be saved by the system. This data will now be referred by the patient while performing the exercises at home and will monitor the movements of patients. The indication will be given if the movement is desirable or undesirable. The efficacy of home-based physiotherapy depends on the correct and systematic execution of prescribed exercises. Feedback systems enable it to accurately track exercise execution and prevent patients from unconsciously introducing incorrect postures or improper muscular loads on the prescribed exercises. This system will have Bluetooth connectivity whic...

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Abstract:

In recent years, domestic fire cases due to Liquid Petroleum Gas (LPG) leakage are happening frequently and such accidents are increasing every day. If a person is in a hurry and sometimes due to negligence the gas regulator may not fit properly or have not switched off the gas regulator properly, then there might be chances of accidents due to Liquid Petroleum Gas leakage. The Liquid Petroleum Gas leakage detection and alert indication system is very helpful in the cases when no one is present in the house with Liquid Petroleum Gas cylinders in it. Now a days Liquid Petroleum Gas cylinders are not only used for the cooking but they are widely used for water heating or as a gas for the vehicles. Liquid Petroleum Gas leakage detection and alert indication system is required in all these situations to provide safety and avoid house fire accidents. The developed Liquid Petroleum Gas leakage detection and alert indication system is light weight compact, based on Arduino and by using Global System for Mobile communication modem it sends alert Short Message Service /Call indication on mobile. Global System for Mobile (GSM) communication modem sends Short Message Service /Call to the user when the Liquid Petroleum Gas leakage goes beyond the set limit of threshold level. When Liquid Petroleum Gas is detected, the system not only sends an Short Message Service/Call alert but it also turns on the Light Emitting Diode (LED) for visual indication and buzzer to alert the person which is in vicinity of the system.

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Power Spectral Density Analysis of Decomposed EMG Signals for Dominant and Non-dominant Hands

Publisher: IEEE

[Cite This](#)[PDF](#)Kalyani Mahajan ; Revati Shriram ; Nivedita Daimiwal ; Sushmita Gandhi [All Authors](#)59
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Abstract:

Electromyography (EMG) computes the electrical activity of the muscles. While performing certain work, groups of muscles are incorporated. As the muscle force required to perform that particular work increases, the central nervous system triggering signal increases in terms of activation of more motor units under that particular muscle. This results in high EMG signal amplitudes. EMG signal varies even when the same work is performed by both hands i.e., dominating and non-dominating hands. This led us to evaluate EMG Power Spectral Density (PSD) while performing passive muscle movement and active muscle movement, carrying different weights. EMG was recorded at the biceps brachii and analyzed for 7–10 healthy subjects. Subjects were requested to perform the concentric contraction of both dominating and non-dominating hand muscles while lifting 0, 1, 2, 3, and 4 kgs of the weight. The result shows significant EMG PSD variations during the contraction of hand muscles. These findings could be applied to the patient's muscle movement to develop a verification of the presence of muscle activity in the patients for both hands.

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