# Shri Dharmasthala Manjunatheshwara College of Engineering and Technology

Dharwad - 580002, Karnataka, INDIA

# IEEE International Conference on Applied Intelligence and Sustainable Computing (ICAISC-2023)

*16th - 17th June, 2023*  **Hybrid Mode**



## Organized by

### Shri Dharmasthala Manjunatheshwara College of Engineering and Technology

Dharwad - 580002, Karnataka, INDIA

**Technical Co-Sponsors**

IEEE BANGALORE SECTION

IEEE NKSS

# ICAISC
# 2023

With the blessings of

**Poojya Dr. D. Veerendra Heggade**
President
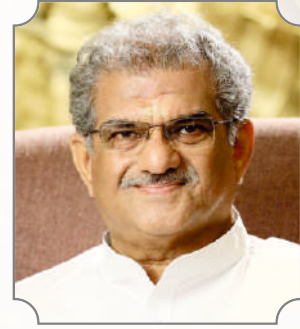Shri Dharmasthala Manjunatheshwara
Education Society,
Ujire, Dakshina Kannada

# Messages from Renowned Dignitaries

**Dr. D. Veerendra Heggade**
President, SDME Society, Ujire
Chief Patron– ICAISC 2023

## *President's Message*

I am very glad that ICAISC-23, International Conference on Applied Intelligence and Sustainable Computing(ICAISC-2023) organized by the Shri Dharmasthala Manjunatheshwara College of Engineering & Technology, Dharwad is the path breaking initiative and will pave a way for future technological development in the field of Intelligence systems and Energy aware computing.

The conference ICAISC-23 aims at the new and recent developments in the various fields and will have tremendous impact on the society in future.

I am very happy to learn that ICAISC-23 has received excellent response from the academia and industry community across world. I hope this conference will help our faculty and students to acquire good knowledge in the latest technologies emerging in this field.

My best wishes to the Shri Dharmasthala Manjunatheshwara College of Engineering & Technology, Dharwad Team for the success of the conference.

**Shri Surendra Kumar**
Vice President, SDME Society, Ujire
Chief Co-Patron– ICAISC 2023

## *Vice-President's Message*

It is my pleasure to welcome all the participants of the International Conference on Applied Intelligence and Sustainable Computing(ICAISC-2023), organized by Shri Dharmasthala Manjunatheshwara College of Engineering & Technology, Dharwad, Karnataka, and to share my warmest regards to IEEE members. I would also like to thank the members of all the committees for their efforts in developing this exciting and important event.

It is incredibly exciting to have such a range of researchers, scientists, engineers, research scholars, and industrial participants interested in the advances of computer science and engineering, with different perspectives and unique ideas, discussing opportunities. Collaborating and engaging together with both likeminded and diverse individuals helps us grow professionally, as well as advance technology for the benefit of humanity.

Hopefully your involvement with ICAISC-2023 is both personally and professionally gratifying. Wishing you a successful, enlightening conference!

**Shri Jeevandhar Kumar**
Secretary, SDME Society, Dharwad
Patron– ICAISC 2023
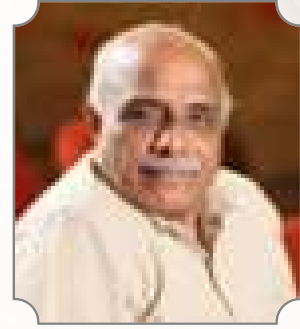
## *Secretary's Message*

It gives me great pleasure that our college is hosting the IEEE International Conference on Applied Intelligence and Sustainable Computing (ICAISC-2023) in association with IEEE Bangalore Section & IEEE North Karnataka Subsection on 16th-17th June, 2023.

The organising committee members of this Institute definitely deserve appreciation  for  their efforts in translating the mission of the institute into reality.

The convergence of the best brains from academic institutions, scientific organization, industry and R&D organization will go on a long way in strengthening the various fields of Information Technology.

Hence, I am keenly looking forward to the outcome of the conference. I extend my sincere best wishes to the organizers for the success of the conference.

**Deepak Mathur**
2023 IEEE Vice President-Elect
Member and Geographic Activities

## *Message*

I am very glad to learn that, Shri Dharmasthala Manjunatheshwara College of Engineering & Technology, Dharwad is organizing IEEE International Conference on Applied Intelligence and Sustainable Computing (ICAISC – 2023) on 16th & 17th June 2023 in association with IEEE Bangalore Section and IEEE North Karnataka Subsection.

It is indeed hearting to know that galaxy of eminent scientists, engineers, professionals and the students are participating in this two days conference. I hope this conference will act as a catalyst by providing useful and effective interaction of ideas. This should go a long way in transforming our lives for better.

I congratulate the Shri Dharmasthala Manjunatheshwara College of Engineering & Technology, Dharwad for taking initiation to organize this IEEE Conference.

**Dr. Celia Shahnaz**
Professor
Department of EEE, BUET
2022 IEEE WIE Committee Chair-Elect

## *Message*

I am honoured and pleased to welcome you all to First IEEE International Conference on Applied Intelligence and Sustainable Computing (ICAISC – 2023) on 16th & 17th June 2023 organized by Shri Dharmasthala Manjunatheshwara College of Engineering & Technology, Dharwad in association with IEEE Bangalore Section and North Karnataka Subsection. As we are seeing rapid advances in Computer Science and Electronics, it is particularly an ideal time to be involved more in these fields and hosting of such conferences to facilitate such knowledge platforms. I honestly believe that this conference will be an excellent place for networking opportunities with researchers, academicians and I hope that it will be a platform for coordinating new partnerships which advance not only the field but the careers of all participants. From student to senior researchers, it is a great opportunity to discuss ideas and develop new research and developments in these fields.

I congratulate the organizers from Shri Dharmasthala Manjunatheshwara College of Engineering & Technology, Dharwad  for their efforts in organizing such a conference in this situation for the benefit of the society.

I wish all the participants a successful conference.

**Dr. Supavadee Aramvith**
Associate Professor in Electrical Engineering,
Chulalongkorn University
Associate Head, Internationalization
Head, Multimedia Data Analytics and
Processing Research Unit
Thailand

## *Message*

It's my pleasure to know that, Shri Dharmasthala Manjunatheshwara College of Engineering & Technology, Dharwad is organizing IEEE International Conference on Applied Intelligence and Sustainable Computing (ICAISC–2023) on 16th & 17th June 2023 in association with IEEE Bangalore Section and IEEE North Karnataka Subsection.

ICAISC–2023 will cover wide range of topics in Electronics, Communication, Computer Science, Robotics, Machine Learning and related interdisciplinary topics. I am sure this conference will not only provide a platform for the delegates to present their work, but it will also give ample exposure and opportunities for them to interact with international and national level experts in various domains of research.

I thank all the organizers and management of Shri Dharmasthala Manjunatheshwara College of Engineering & Technology, Dharwad for their support in organizing this exciting conference.

Whole heartedly wish IEEE ICAISC–2023 to be a grand success!

**Dr. Gian Carlo Cardarilli**
Full Professor, Digital Electronics & Electronics for Telecom
President of ULISSE Consortium
Director of Dept. of Electronic Engineering
University of Rome Tor Vergata
Via del Politecnico, 100133 Roma, ITALY

# MESSAGE

I am glad that Shri Dharmasthala Manjunatheshwara College of Engineering & Technology, Dharwad organized IEEE International Conference on Applied Intelligence and Sustainable Computing (ICAISC–2023) on 16th & 17th June 2023 in association with IEEE Bangalore Section and IEEE North Karnataka Subsection. The treated topic suggests that this conference focuses more on practical applications rather than on theoretical inputs in the context of the current Corporate World.

I would like to extend my heartfelt congratulations to everyone involved in the organization of ICAISC – 2023, particularly the dedicated staff and enthusiastic students of Shri Dharmasthala Manjunatheshwara College of Engineering & Technology, Dharwad. It is your hard work and active participation that contribute to the resounding success of such events.

**Dr. Wen Cheng Lai**
Department of Electronic Engineering
National Taiwan University of Science
and Technology, Taiwan

## *Message*

I am extremely glad to know about IEEE International Conference on Applied Intelligence and Sustainable Computing (ICAISC – 2023) on 16th & 17th June 2023 organized by Shri Dharmasthala Manjunatheshwara College of Engineering & Technology, Dharwad

I am sure the papers are well reviewed by experts as per the quality standards expected by IEEE. I urge most of these publications shall get translated to commercial products of social relevance.

The effort put in by the Technical committee as well as Organizing committee are well appreciated.

I wish the conference all the very best to achieve its objectives!


With best Regards


Wen Cheng Lai

**Dr. Aloknath De**
Chair,
IEEE Bangalore Section

## *Message*

It gives me immense pleasure to learn that Shri Dharmasthala Manjunatheshwara College of Engineering & Technology, Dharwad is organizing IEEE International Conference on Applied Intelligence and Sustainable Computing (ICAISC – 2023) on 16th & 17th June 2023 in association with IEEE North Karnataka Subsection and IEEE Bangalore Section.

This conference program has been designed to provide ample opportunities to researchers to network and to share ideas and information about the theme.

My best wishes to the organizers and I also wish all the participants a very enriching time at this conference.

**Dr. P. Deepa Shenoy**
2022 Chair,
IEEE Bangalore Section

## *Message*

With great pleasure, I appreciate Shri Dharmasthala Manjunatheshwara College of Engineering & Technology, Dharwad for organizing IEEE International Conference on Applied Intelligence and Sustainable Computing (ICAISC – 2023) on 16th & 17th June 2023 in association with IEEE Bangalore Section and IEEE North Karnataka Subsection.

The present conference is aimed at providing a unique platform of opportunities to academicians, researchers and policy makers to network and to share their ideas and information about the conference.

I convey my best wishes to the entire organizing team and I also wish all the delegates a very fulfilling time at this conference.

**Dr. Parameshachari B.D.**
Professor, Department of ECE,
Nitte Meenakshi Institute of Technology, Bengaluru
SAC Chair, IEEE Bangalore Section.

## *Message*

I am honored and delighted to be a part of the International Conference on Applied Intelligence and Sustainable Computing (ICAISC–2023) on 16th & 17th June 2023 organized by SDMCET, Dharwad Karnataka in association with the IEEE Bangalore Section and IEEE North Karnataka Subsection.

ICAISC–2023 is committed to making genuine and reliable contributions to the scientific community and also makes the perfect platform for global networking as it brings together renowned speakers and scientists across the globe. In general, this Conference promotes top-level quality research on a globalized scale, thus making discussions, and presentations more competitive, by bringing the core focus to recent outstanding achievements in the domains of computer sciences and engineering.

I sincerely hope that this conference will deliberate and discuss all the different facets of this exciting topic and come up with recommendations that will lead to better technological expansion that can efficiently deal with current and future societal challenges.

I congratulate everyone for their commitment and active participation and for the execution of a successful conference.

**Dr. K. Gopinath**
Principal, SDMCET, Dharwad
General Chair– ICAISC 2023

## *Principal's Message*

On behalf of SDM Dharwad, it is my great pleasure to extend a warm welcome to all participants of the International Conference on Applied Intelligence and Sustainable Computing - ICAISC 2023. I am delighted to notice the various brilliant minds, distinguished researchers and industry experts in ICAISC 2023.

ICAISC 2023 brings together a diverse community of individuals who are at the forefront of their respective fields. It is a melting pot of expertise, experiences, and perspectives, which promises to ignite stimulating discussions, foster interdisciplinary collaborations, and pave the way for groundbreaking research outcomes. I encourage you all to actively engage in these discussions, share your insights, and forge connections that extend beyond the confines of this conference.

Furthermore, I would like to express my deep appreciation to Dr. Satish S Bhairannawar, Organising Chair-ICAISC 2023, Dr.V.K.Parvati and Dr. Rajashekarappa and also to other volunteers and sponsors whose tireless efforts have made this event possible. Their dedication and commitment to creating a memorable conference experience for all of us deserve our utmost gratitude.

I wish you all an engaging, inspiring, and successful conference. May your interactions be fruitful, your presentations impactful, and your experiences memorable.

Thank you, and enjoy the conference !

**Dr. Satish Bhairannawar**
Dean (Industry Institution Interface)
Professor (ECE)
IEEE SB Counselor
Organising Chair – ICAISC 2023
SDMCET, Dharwad

## *Organising Chair's Message*

I am glad to share that Shri Dharmasthala Manjunatheshwara College of Engineering & Technology, Dharwad is organizing IEEE International Conference on Applied Intelligence and Sustainable Computing (ICAISC– 2023) on 16th & 17th June 2023 in association with IEEE Bangalore Section and IEEE North Karnataka Subsection.

I am also happy to share that, ICAISC-2023 has attracted around 1000+submissions. ICAISC-2023 proved to be very popular and received submissions from all over the world and to name a few : United States, UK, Canada, China, Norway, Turkey, Hungary, Sri Lanka, South Africa, Nigeria, Saudi Arabia, Mauritius, Ethiopia, Brazil, Malaysia, Hongkong, Philippines and Bangladesh.

This International Conference will provide a premier interdisciplinary platform for researchers, practitioners and educators to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered and solutions adopted in the fields of Computer Science. Electronics and Electrical Engineering.

I congratulate the entire organizing team and Committee Members of ICAISC-2023 who have taken the initiative in the direction of encouraging young engineers, researchers and scholars and I wish this conference a great success.

# Shri Dharmasthala Manjunatheshwara College of Engineering and Technology

Dharwad - 580002, Karnataka, India

# IEEE International Conference on Applied Intelligence and sustainable computing (ICAISC)

# ICAISC 2023

# ABOUT SHRI DHARMASTHALA MANJUNATHESHWARA COLLEGE OF ENGINEERING AND TECHNOLOGY



Shri Dharmasthala Manjunatheshwara Educational [SDME] Society, Ujire® was established with the primary objective of making education accessible and affordable to rural youth under the guidance of Dharmaadhikari, Reformer, Educationist, Philosopher and Philanthropist, Padmavibhushana Poojya Dr.D. Veerendra Heggade. As the President of the SDME Society, he is the guiding spirit and driving force for the institution. With the hallmarked vision of inculcating Value into Education, at present, it manages 56 educational institutions from Kindergarten to Doctoral Studies in the state of Karnataka in India. The institutions offer quality education in the fields of General, Law, Technical, Medical and Management Studies. These institutions ensure quality through updated skill sets and value based education.

The SDME Society Trust Office is located at Ujire, which acts as the central functioning unit for all management actions for SDM Institutions. Dr. Satheeshchandra, Secretary Ujire and Shri Jeevandhar Kumar, Secretary Dharwad under whose guidance the institutions have been functioning with renewed efficiency.

Shri Dharmasthala Manjunatheshwara College of Engineering & Technology, Dharwad offers 8 Undergraduate Programmes SDMCET has 7 M.Tech/MBA programs and 11 research centres across the college and a total of 154 research scholars working under more than 80 research guides at present. SDMCET has 25 funded research projects granted by funding agencies such as DRDO, ISRO, AICTE, DST, VGST, VTU, etc and 06 have been completed and 19 are on-going with a total sanction of more than 4.5 crores. Thus, the faculty members promote and deeply involved in research and consultancy in their respective discipline as well as interdisciplinary domains. This activity in the Institute brings up its intellectual base.

# Invited Guests: ICAISC -2023



**Dr. Luca Di Nunzio**
University of Rome Tor Vergata,
Rome, Italy



**Dr. S. R. Mahadeva Prasanna**
Indian Institute of Technology,
Dharwad, India

# Keynote Speakers: ICAISC -2023

**Dr. Loo Xi Sung**
School of Engineering, Republic Polytechnic,
Singapore

**Dr. Victor Chang**
Aston University,
United Kingdom

**Dr. Raffaele Carli**
Senior Assistant Professor of Automatic Control at the
Polytechnic of Bari,
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Dharwad, Execom, IEEE ITS Bangalore
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**Prof. V. K. Parvati**
PRO, Associate Professor of ISE
Department, SDMCET, Dharwad

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clarification on the issue

# Investigation and Analyses of Data Processing Through Sports using Scripting Language: A Novel Paradigm

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Bengaluru, India

**Vinay.T**
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## Abstract

Every business firm is implementing the newest technology to expand their businesses as a result of the expansion in the field of Data science. In the market, there is competition for better management, higher evaluation quality, and improved facilities. The sole means of accomplish all of these traits is to carry out data examination with greater accuracy and purity. With the use of existing data, machine learning helps to predict future outcomes so that decisions can be improved. Cricket is a popular sport that is played and viewed throughout worldwide. Many of these cricket supporters hope that their team will perform well and get the victory. Teams should improve their individual and team performances if they want to win. The ability to envisage the winner of a test match is affected by a variety of variables, including team strengths, ground and weather. A detailed investigation has been used to anticipate the game's match winner through several criteria that have been examined in this paper. This paper discusses guessing the champion of a cricket competition before it began. Different machine learning methods, including Random Forest, SVM, and Decision Tree, have been applied to test and learning information set of various size for this model-building purpose. The predictive algorithm will be useful for the International Cricket Council in terms of cricket analysis and team strength evaluation. This model will help the implementations for betting and tournament media.

**Keywords:** Test Match, Data Analysis, Sports, Machine Learning, Modeling, Match Forecast.

# Multi-class Classification of Skin Diseases using Pre-trained DenseNet Architecture on Dermoscopy Images

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**Sheifali Gupta**
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## Abstract

Dermoscopy is a non-invasive procedure used to visualize skin lesions at a magnified level. In this research, are trained DenseNet model is used for the classification of seven class skin disease dermoscopy images. The proposed method is simulated using different confusion matrix parameters on the HAM10000 dataset. The extracted features are then used to classify the images into one of several predefined skin disease categories. A sizable collection of dermoscopy images is used to train the CNN model images and among the classification of the seven classes of the skin achieved accuracy as high as 98% for one of the classes and the overall accuracy of the model after training is 88.78. The results of the research demonstrate the achievement of using CNNs for classifying skin diseases from dermoscopy images, which has potential applications in medical diagnosis and treatment planning.

**Keywords:** Dermoscopy, Skin lesions, Diseases, Medical, Treatment, Cancer, Health, Deep learning (DL).

# Intelligent Combination of Approaches Towards Improved Bangla Text Summarization

**Alam Khan**
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## Abstract

Text summarization is a technique to extract the main concept from a large document. It turns a big document into a smaller one without changing the main context. Text summarization have widely research area nowadays. There are two types of text summarization, one generates an extractive summary and the other generates an abstractive summary. Herein this paper, an intelligent model is proposed which can make an extractive summary from a given document. After completing some preprocessing steps on the document, some useful combinations of methods are applied such as Named Entity-based scoring, keyword based-scoring, parts of speech-based scoring, and word and sentence based-analysis to rank the sentences of the passage. These methods combined together generated the final summary. The proposed model iscompared with multiple human-made summaries and the evaluation was performed with respect to precision, recall, and F-measures. The model is also compared with the state-of-the-art approaches and found to show its effectiveness with respect to Precision (0.606) and F-measure (0.6177) evaluation measures.

**Keywords:** Extractive summary, data preprocessing, TF-IDF, Sentence Scoring, Keyword Scoring, POS Tagging, Positional Value.

# Fuzzy Logic-based Man-in-the-Middle Attack Detection and Improving Routing Efficiency in the IoT Network

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**Kamalakannan S**
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## Abstract

The Internet of Things (IoT) is a remarkable technology for industrial development, smart homes, intelligent transportation, and more. Typically, in an IoT network, a Man in the Middle attack creates an intrusion node that can, either arbitrarily discard data packets or steal the data, thereby disturbing network performance and reducing network efficiency. While there have been numerous approaches using machine learning techniques were proposed to detect the intrusion nodes, they have often failed to address issues related to throughput and packet loss ratios. Additionally, the conventional approach does not concentrate on routing efficiency. A Fuzzy Logic based Man-in-the-Middle attack detection and Cuckoo Search Algorithm (FLCSA) is proposed to solve this issue for improving routing efficiency in the IoT Network. In this proposed work, the fuzzy logic system is used to efficiently detect intrusion nodes using the inputs such as node degree, node energy, and node delay and outputs that isolate intrusion nodes in the network. The cuckoo search (CS) algorithm is used to form the optimal route from sender to receiver in the network, selecting efficient relays based on node energy, link lifetime, and node bandwidth. The simulation results show that the proposed method has better throughput, increased detection ratio, and minimized network delay.

**Keywords:** Man-in-the-Middle attack, Cuckoo search algorithm, Internet of Things, Fuzzy logic system, Intrusion detection, Routing efficiency.

# Performance Analysis of 2D-DCT based JPEG Compression Algorithm

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## Abstract

Image Compression is an important process in digital image processing, allowing for the reduction of data size while maintaining image quality. The technique of Discrete Cosine Transform (DCT) is commonly employed in the compression of images, which involves transforming an image from the spatial domain to the frequency domain. Further, the image is quantized, and encoded. In this paper, the effectiveness of DCT for image compression is examined and the compressed image quality is analyzed using Peak Signal-to-Noise Ratio (PSNR) and Mean Squared Error (MSE) metrics. Results demonstrate that DCT is an effective method for image compression, providing high compression ratios while maintaining reasonable image quality. Using the algorithm discussed in this paper, for a Quality factor (Q-factor) of 50, a compression ratio of 26.42:1, PSNR of 31.95 dB, and MSE of 0.0007 was achieved.

**Keywords:** DCT, Color Space, Quantization, Encoding, Sequencing, Q-factor, Compression ratio, MSE, PSNR.

# Electroencephalogram Based Depression Detection Using Ensemble Approach

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## Abstract

Numerous people Shave lately been diagnosed with mental diseases such as depression all around the globe. The conventional methodology for distinguishing depression depends on the clinical questionnaire, which relies upon the patients' reactions as well as detecting their behavior exercises. Recent advances in EEG and processing speed, along with well-trained ML models, have resulted in a potent method for diagnosing psychological disorders like depression, anxiety, and many more. Signals captured by the EEG equipment can measure potential changes between different areas of the cortex. EEG readings are a useful technique for diagnosing depression and are said to be more accurate than other signals. In this paper, we implemented the ensemble approach to explore depression recognition. In an experiment, 53 individuals took part, including 24 depressed patients and 29 healthy controls. We divided the extracted features from the EEG data into two: linear features and non-linear features. In this study, we developed an ensemble approach for detecting depression from EEG signals. We extracted linear and nonlinear features from the EEG data and used dimensionality reduction with LDA to improve classification performance. Our approach achieved a 91% accuracy rate in identifying MDD patients, outperforming previous studies. Our findings suggest that EEG-based machine learning is a promising new method for diagnosing depression. Future studies are needed to validate our approach in larger clinical trials.

**Keywords:** MDD, EEG, Machine Learning, Ensemble.

# A Combined Approach for Efficient Compression and Restoration of Multispectral Satellite Images

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## Abstract

Our everyday lives are increasingly influenced by satellite images. They are an integral part of the daily news such as weather forecasting, waterbody survey, land surveying etc. Multispectral images have multiple bands, and the information will be present in at least one band. As the satellite images are very large in size, FFT2 compression technique has been proposed in this paper. This method is a lossy compression technique and granular noises get introduced in the compressed image. For restoring the images from the granular noises which are caused from sensor noises and lossy compression, an autoencoder neural network has been implemented. The neural network is trained and evaluated. The experimental results have shown that the proposed method for compression has resulted in a good Compression Ratio and an autoencoder neural network model removes the granular noise efficiently.

Keywords: Autoencoders, Compression, Fast Fourier Transform, Multispectral Image, Restoration.

# A Comprehensive Study of Machine Learning Algorithms for Fruit Genotype Classification

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## Abstract

There are over 200 distinct date fruit varieties around the globe. Physical characteristics such as size and structure (collectively known as morphological attributes), colour, and other shape characteristics are used to manually determine their class of genome type. Date fruit processing industries require expert systems to determine the type of a fruit based on its exterior without a great deal of effort and time-consuming information. This study aims to identify the type of date fruit among the seven varieties Sukkary, Ruthana, Barhee, Safawi, Deglet Nour, Sagai, and Rotab Mozafati, which are popularly cultivated in Turkey and other Middle Eastern countries. Using image processing techniques, a total of 34 attributes were extracted from each date fruit, including morphological (12), shape (4), and colour (18). Performance analysis of machine learning models is investigated with the different sets of extracted features to know the superior classifier. Analysis is carried out with individual sets of features and combinations of features.

Keywords: Date fruit classification, Decision Tree, SVM, KNN, NN, Shape factors, Morphological, Colour features.

**Paper ID
ICAISC 340**

## Design & Implementation of Novel AI Based Hand Gestured Smart Wheelchair

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### Abstract

Disability is a significant health concern in India, according to research of disabled people carried by NSSO. Cerebral palsy, dwarfism, muscular dystrophy, as well as other conditions can cause disability, although the majority of these disorders are acquired at birth or accidentally. The wheelchairs are the ideal mobility support for those with physical impairments. The purpose of this proposed work is to create a programmable wheelchair which would aid individuals with physical impairments in their daily activities and fulfilment of some routine life. Individuals who have physical abnormalities lack the ability to move around just like regular people. They are indeed forced to rely on others for all of their daily necessities. They feel discouraged due to their dependence on others. An AI-based hand gestured smart wheelchair is a type of wheelchair that uses artificial intelligence technology to interpret hand gestures and translate them into wheelchair movements. This type of wheelchair is designed to provide greater mobility and independence to people with disabilities, particularly those who may have limited mobility in their arms or hands. The system works by using sensors and cameras to detect and interpret the user's hand gestures, which are then transmitted to the wheelchair's control system. The control system processes these gestures and translates them into specific commands, such as moving the wheelchair forward, turning left or right, or stopping. One of the key benefits of an AI-based hand gestured smart wheelchair is that it allows for a more intuitive and natural control mechanism, as users can simply gesture in the direction they want to go rather than having to manipulate joysticks or other controls. Additionally, this type of wheelchair can be adapted to individual users, allowing them to customize their gestures to better suit their needs.

**Keywords:** Smart Wheelchair, Gesture, Artificial Intelligence, Disability, Wheel Chair.

**Paper ID
ICAISC 349**

## Classification of Alzheimer's disease using 2D/3D Convolutional Neural Networks

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### Abstract

The neurodegenerative brain disorder known as Alzheimer's disease (AD) is brought on by the buildup of amyloid proteins, the formation of plaques, and the loss of neurons. Parkinson's disease (PD), another prevalent subtype of dementia like AD, is characterized by the loss of dopaminergic neurons in the midbrain region known as the substantia nigra pars compacta. Both AD and PD aim to reduce healthcare expenses by reducing the world's ageing population. Therefore, techniques that aid in the early detection of these disorders are required. In the area of medical imaging, where there is typically a limited amount of data that can be used for training, these drawbacks make it difficult to employ the most recent deep learning methods. Humans have difficulty distinguishing between early forms of Alzheimer's disease and correctly diagnosing them. Convolutional networks can be used to classify human MRI scans, as this paper demonstrates. Mild Cognitive Impairment, Alzheimer's Disease, and Clinically Normal are the three categories. Finally, a functional model constructed with three-dimensional convolutional layers that performs well across the three classes is presented. The assessment results show that the proposed strategy accomplishes the model exhibition on Promotion conclusion by normal of 82% exactness.

**Keywords:** Convolutional Neural Networks, Alzheimer's disease, Classification, MRI images.

# Breast Carcinoma Detection using WT Segmentation based on Soft Computing

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## Abstract

Throughout the past ten years, new research directions have emerged in response to the growing demand for fighting breast cancer early detection and diagnosis. Breast cancer is the most common malignancy worldwide, affecting millions of female patients each year. It also accounts for most women's cancer-related deaths. When used to classify tumors using an image database, convolutional neural networks show promising results. The planned project primarily focuses on the identification of breast cancer using a soft computing approach that makes use of feature extractors that have been trained on millions of different images and that use pre-trained models as feature extractors. The proposed research examines how pre-trained models categorize breast tumors when used with mammographic pictures. Also, the proposed work suggests a shallow custom convolutional neural network that performs better than training models in a number of performance-related metrics. Using bespoke Wiener Threshold (WT) segmentation, the suggested model's impressive accuracy of 86.23% was attained in 36m25s, which is less time than the existing Gaussian threshold segmentation computation time.

**Keywords:** Mammographic images, Convolutional Neural Network, MATLAB, Filters, Segmentation.

# AIOps: Analysing Cloud Failure Detection Approaches for Enhanced Operational Efficency

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## Abstract

In recent years, Modern society is progressively moving in the direction of complex and distributed computing structures. Because of the high complexity of the organization, management teams execute regular checking and resolving processes to extend the consistency and reliability of modern system applications. Hence, the concept of automated and intelligent systems is receiving more attention from Information Technology (IT), manufacturing, and academic fields. In the modern day, IT organizations and institutions are growing faster to reduce human supervision because it is more problematic to handle. Therefore, in this research, Artificial Intelligence for IT Operations (AIOps) is analyzed to overcome modern IT management difficulties due to AI and Big Data. Even though, the research progress on AIOps is still unstructured and unknown, because of lacking principles in classifying impacts for data necessities, target goals, and factors. This review work provides an in-depth analysis to gather and establish several contributions to AIOps in a unique reference index. This research is focused to minimize cloud service interruption and ensure high system accessibility by utilizing AI methods. This comprehensive research supports researchers in accomplishing a better solution for cloud failure detection.

**Keywords:** Artificial Intelligence, Cloud Failure Detection, Information Technology, Intelligent Outage Service, Service Interruption.

# Compare the Impacts of Data Correlation on Privacy Leakage in a Combined Privacy Preserving Approach

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## Abstract

In the era of digitization, Data collection and sharing are the two essential phases in various real-time applications to provide better social benefits to users. Collection and sharing of users' private data may lead to compromised users' privacy. Differential Privacy (DP) and Local Differential Privacy (LDP) are the two variant privacy mechanisms, and these mechanisms offer a strict privacy guarantee against an adversary with unbounded background knowledge. The traditional DP and LDP mechanism fails to provide a strict privacy guarantee in a continuously correlated data release setting. Many works exist to address this correlated issue and proposed solutions under the protection of DP and LDP. However, any real-time applications require a privacy mechanism in either of three ways: either a privacy guarantee from the data collector (achieved using DP) or from the data provider itself (achieved using LDP) or from the both data collector and provider. To the best of our knowledge, none of the work has shown the impact of data correlation on privacy leakage in a combined (LDP+DP) approach. This paper analyzes and studies the impact of data correlation on privacy leakage in all possible combinations of the combined (LDP+DP) approach. We performed a series of experiments with the real and synthetic datasets and the results find that the combined LDP+DP of PBA mechanism is comparatively better than other state-of-the-art combined approaches.

**Keywords:** Differential privacy, Local Differential privacy, Correlated data, Privacy budget, Streaming data.

# Heart Disease Prediction using Ensemble Learning

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## Abstract

Early disease prediction prevents patients to encounter severe situations. Transition from symptoms to disease stage of any disease takes time. Prediction of disease in this transition stage is called early detection. For the heart disease risk prediction in this study, an ensemble learning system is recommended. The stack ensemble learning approach is used to predict cardiac illness using a variety of heterogeneous weak learners. These include Multi-Layer Perceptron Classifier, Decision Tree Classifier, Support Vector Classifier, and Logistic Regression. All of these ML techniques are layered in the stack-based Ensemble classifier. Using stack-based ensemble classification, the dataset is utilized to distinguish between the presence and absence of early heart disease symptoms. The complete dataset is used as input for all weak learning ML algorithms. A meta-classifier is used in the ensemble learning technique known as stacking to combine many classification models. Performance evaluation for all ML algorithms is constructed using the Logistic Regression metaclassifier-based technique. SMOTE is used to handle unbalanced data, as determined by the classification of the data. The dataset needed for disease prediction is taken from UCI repository. A Python-based implementation of the proposed method is carried out. The ensemble approach approached 0.922 (AUC) in the ROC-AUC curve. The performance is evaluated using confusion matrix and classification reports.

**Keywords:** Disease prediction, Isolation Forest, Ensemble learning.

**Paper ID
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# Shopping Cart Analysis Using Apriori Algorithm and Association Rules

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## Abstract

Machine Learning and Artificial Intelligence has many applications in today's world. Computers can process huge sets of data very quickly. One of the applications of big data analysis is data mining. Retailers use market basket analysis, a data mining technique, to boost sales by better understanding customer buying habits. Market basket analysis can be a powerful tool for retailers, as it allows them to gain insights into customer purchasing behavior and develop strategies for increasing sales and customer loyalty. Association rules are used in market basket analysis to forecast the possibility that two products will be bought together. The if, them construct, or association rule mining, is the basis for Market Basket Analysis. We find that the apriori algorithm is faster than the existing implementations of apriori by a magnitude of 100.

**Keywords:** Data Mining, Apriori algorithm, Association rule mining.

**Paper ID
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# Digi-Farming Assistant for Soil Quality Analysis

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## Abstract

Agriculture is a critical sector in India, as it is the main source of livelihood for nearly 70% of the population. Wireless Sensor Networks (WSN) are an emerging technology that can be utilized to improve agricultural practices. Smart farming using WSN involves real-time monitoring and control of various environmental factors such as temperature, light, humidity, Nitrogen, Phosphorus, Potassium (NPK) and $CO_2$ of the soil. This information can assist farmers in making informed decisions about farming practices. In this paper, we conduct a review of the existing research on smart farming using WSN and present a proposed design and implementation of a WSN-based smart farming system. The system consists of two sensor nodes placed in the farm, which collect and transmit data to a central base station. Through extensive research, we evaluate the proposed system and find that it can efficiently monitor various environmental parameters and provide farmers with real-time information to improve decision-making and productivity. The resulting model showed that it can perform well with a high accuracy up to a specific range. The paper concludes by discussing the potential benefits and challenges of implementing WSN-based smart farming systems and outlines future research directions. In summary, smart farming using WSN has the potential to enhance agricultural practices by promoting more sustainable and efficient use of resources, increasing productivity.

**Keywords:** WSN, NPK, agriculture, soil quality, smart farming.

# AI Based Robot for Beach Cleaning

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## Abstract

"Beach cleaning robots" are used to pick up trash and debris from beaches. Beach cleaning robots are becoming more and more popular since they can work continuously and effectively without human labor, keeping beaches clean and safe for tourists. These Robots can assist in reducing the quantity of plastic and other rubbishthat ends up in the ocean and can also assist in protecting wildlife from harm caused by beach litter. The Raspberry Pi is a crucial component in our work to construct the AI-based robot. The Raspberry Pi Pico is also used to control the movement of the object in the photo that is taken with the Pi camera. The waste is identified, and using motors and aconveyor belt, it is collected and dumped in a separate location to maintain cleanliness.

**Keywords:** Raspberry Pi, Raspberry Pi Pico, Tensor Flow, OpenCV, Pi Camera Interfacing, Image Processing.

# Implementation of Smart Security System in Agriculture Fields using Embedded Machine Learning

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## Abstract

Tiny Machine Learning (TinyML), a branch of machine learning that focuses on the effectiveness of machine learning on extremely constrained edge machines, is flourishing. Deep learning techniques are being used more frequently lately in a variety of data-intensive and time-sensitive Internet of Things (IoT) apps. Because MCUs lack resources like RAM, deploying new methods like Deep Neural Networks (DNN) models on them has proven challenging. However, recent developments in the TinyML space promise to create a completely new class of peripheral apps. By eliminating the need for the cloud's omnipresent computing support, which uses power and presents risks to data security and privacy, TinyML paves the way for the development of original apps and services. Traditional machine learning needs a lot of processing capacity to predict a scenario. This computational capacity will be moved from high-end systems to low-end devices thanks to the TinyML method for machine learning on small devices. To keep the precision of the learning models, enable resource-efficient small edge devices to manage the training and deployment process, maximize computing capacity, and enhance dependability are some of the challenges presented by this change. Here in this paper, we propose a efficient method to detect animals near farmland for security purposes using TinyML and compared with many algorithms and their effectiveness.

**Keywords:** TinyML, TensorFlow Lite, Animal Detection, Object Detection, Security in Smart Agriculture, CNN, Deep learning.

# An Intelligent Camera Based Eye Controlled Wheelchair System: Haar Cascade and Gaze Estimation Algorithms

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## Abstract

This article proposes a system that aids people with disabilities. An Electric Eye Controlled Wheelchair System is built to help disabled people. With the designed system, disabled people can move effortlessly without support from others. The system uses image acquisition wherein the image of the eye is processed to find out the gaze direction of the eye using Haar cascade and gaze estimation algorithms and hence wheelchair moves according to the direction of eyeball movement. The gaze estimation algorithm is so precise and one single algorithm does the job of what two algorithms (Canny Edge detection, Hough Transform) are supposed to do and to execute the same task. With this technique, a disabled person can steer their wheelchair with their eye movement. The webcam is placed in Infront of the person which captures the live movements, and an image processing technique is used to track the position of the pupil in both eyes with the help of a raspberry pi processor. The image processing technique used here is Gaze tracking which uses Open CV. The gaze tracking tracks pupil movement and depicts its coordinates. According to pupil motion, the motor driver will be instructed to go forward, left, and right. A blink instruction is used to stop the wheelchair when the person blinks. Additionally, a front-mounted ultrasonic sensor that can detect obstructions and automatically halt wheelchair movement is mounted for safety reasons. The system is monitored by a Raspberry Pi device, which lowers the cost.

**Keywords:** Image Processing, Haar Cascade, Gaze Tracking, Dlib, Raspberry pi, Open CV.

# Diabetic Prediction Using Machine Algorithm SVM and Decision Tree

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## Abstract

Diabetes is a serious metabolic disorder that affects millions of people globally. Early detection and management of diabetes are essential to prevent severe complications. In recent years, machine learning algorithms have become increasingly popular in the medical field to predict the onset of diabetes. This study aims to predict the onset of diabetes using the support vector machine (SVM) and decision tree algorithms. The dataset used for this study is the Pima Indian diabetes dataset, which contains several features such as glucose, insulin, and body mass index. The problem statement is to determine which algorithm is more accurate in predicting diabetes. The methodology involves implementing the SVM and decision tree algorithms on the dataset and evaluating their performance using metrics such as accuracy, precision, and recall. The results of the study indicate that the SVM algorithm performs better than the decision tree algorithm, with an accuracy of 76.6% compared to 75%. This work concludes that the SVM algorithm is more accurate in predicting diabetes and can be a valuable tool for early detection and management of the disease. This study provides insight into the potential use of machine learning algorithms in the medical field and highlights the need for further research to improve the accuracy of diabetes prediction models.

**Keywords:** Diabetic Prediction, Machine Algorithm, SVM, Decision Tree.

# Disease Detection in Rice leaves using Convolutional Neural Network

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## Abstract

Among the most essential crops for human con sumption is rice, and leaf diseases can significantly affect yield and quality. Almost half of the world's population eats this cereal grain. The identification of rice leaf diseases is crucial for the economy and food security. Rapid corrective measures could be anticipated by understanding the disorders through their peculiar characteristics. The majority of the technical issues with image recognition and classification have been solved using deep learning-based CNN techniques.This study aims to identify the optimal Convolutional Neural Network (CNN) architecture for detecting diseases on rice leaves, considering accuracy, recall, and precision as evaluation metrics. By accurately identifying diseases, the proposed procedure provides valuable assistance to farmers in ensuring healthy crop production. Our analysis reveals that the proposed convolutional model achieves a 75% accuracy rate, demonstrating its effectiveness in disease detection. The suggested method's validity is supported by experimental results, and it effectively identifies rice diseases.

**Keywords:** Rice leaf disease prediction, CNN, disease pre diction.

## Skin Cancer Classification Using CNN

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## Abstract

Skin cancer must need to be detected so that further spread of skin cancers, such as melanoma and focal cell carcinoma can be prevented. There are a lot of things which are having bad impacts on the accuracy of detection. The usage of image processing as well as machine vision in the realm of healthcare and medical applications has increased significantly in the recent scenario. In this paper, we are using convolutional neural networks (CNN) to categorize different forms of skin cancer. Seven different kinds of skin cancer are included in the Skin Cancer Detection dataset which is used to create the proposed system. The CNN design is made up of numerous convolutional layers with max-pooling and batch normalization, which come after a layer which are fully connected, and a SoftMax which is an output layer for classification. Our model has performed well and outperformed conventional machine learning classifiers with an accuracy of more than 95% in the case of almost all the optimizers. Building a CNN model to accurately diagnose skin cancer with a precision of above 80%, lowering its false negativity rate (FNR) in prediction to below 10%, and performing data visualization are some of our goals for this project. The paper shows how CNNs have the potential to effectively classify different types of skin cancer, which can help with the identification and enhancement in a patient's outcome.

**Keywords:** Skin cancer, melanoma, CNN, dermatology, AlexNet, RMSProp, Pooling.

## Sentiment Analysis of Tweets Using Machine Learning Algorithms

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## Abstract

Social media is a popular platform for individuals to express their opinions on various topics. Sentiment analysis using Twitter datasets addresses important requirements such as conducting market research, performing political analysis, and gaining social insights. It empowers businesses to derive valuable insights from user-generated content on Twitter. The objective of this research is to create a sentiment analysis model that can be applied to social media data, specifically tweets from Twitter. The sentiment analysis model is built using machine learning (ML) techniques and natural language processing (NLP) to determine if each tweet is positive or negative. This allows organizations to gauge public opinion and make informed decisions. A vast collection of tweets is used to test the model's performance, with a focus on accuracy, precision, and recall metrics. The results show that the model is successful in analyzing sentiment across various topics and domains. Out of the various machine learning algorithms examined, the Support Vector Machine (SVM) algorithm yielded the highest accuracy of 94.65%. The study as a whole emphasizes the importance of sentiment analysis in comprehending public sentiment on social media platforms.

**Keywords:** Sentiment Analysis, Twitter, Naive Bayes, SVM, Decision Tree, NLP**.**

## Ensemble Machine Learning Techniques for Pancreatic Cancer Detection

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## Abstract

Pancreatic cancer is a disease with high mortality rates that closely correlate with its incidence. Patients with pancreatic cancer often do not experience symptoms until the disease has progressed to an advanced stage. There is no established screening program for individuals at high risk of developing pancreatic cancer. Research conducted earlier has discovered that a combination of three protein biomarkers (LYVE1, REG1A, and TFF1) present in urine can aid in the identification of significant Pancreatic Ductal Adeno Carcinoma (PDAC). The RIC-GD method is a novel machine learning approach proposed for the detection of pancreatic tumors. It utilizes an ensemble classifier to enhance the classification performance. The technique involves using a set of classifiers and determining the similarity measure between the training and testing samples to ensure accurate classification of the samples. The accuracy and specificity of the RIC-GD method have been evaluated and compared to Naive Bayes and decision tree methods. The results demonstrate that the RIC-GD method achieves an accuracy of 92% than the other methods.

**Keywords:** Biomarker, Classification, Gradient Descent, Pancreatic cancer, Pancreatic ductal adenocarcinoma, Rand.

**Paper ID ICAISC 446**

# Architectural design of Built in Self-Test for VLSI Circuits using LFSR

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## Abstract

The term "built in self-test" (BIST) refers to a method of circuit design that facilitates self-testing. The circuit is put through its paces by generating test patterns in this system. Circuit Under Test (CUT) refers to the intended target of the testing. BIST is employed because manual testing makes the testing phase more important than any other step during device or IC fabrication, taking up the most time and being economically unfeasible. The emphasis of this study is on the planning and execution of BIST for the verification of a combinational logic circuit. The proposed hardware includes a signature analyzer, a comparator, a signature generator, and a linear feedback shift register. The CUT is activated on the negative rising edge of the clock signal, and LFSR is a pattern generator that produces $2^{((n-1))}$ possible test patterns. At the rising edge of clock, the CUT's output is fed into the signature analyzer. The signature analyzer's output is placed through a comparison with the ideal signature value provided by the comparator. If the comparator's output is logic '1', then there is no error in CUT; otherwise, CUT has an error. The signature analyzer produces two separate signature values. The test performance obtained with the implementation of proposed BIST architecture is sufficient to overcome the drawback of the hardware complexity caused by the additional BIST circuitry. Relative to that of an externally applied test, the technique permits the use of inexpensive testing equipment throughout all phases of production. The proposed technique is developed using Hardware description language and is implemented and tested on various FPGA devices.

**Keywords:** Built in Self-Test, Linear feedback shift register, Signature analyzer, Circuit Under Test.

**Paper ID ICAISC 491**

# Character Recognition Techniques using Machine Learning: A Comprehensive Study

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## Abstract

Optical Character Recognition (OCR) technology is essential in converting printed or handwritten documents into machine-readable text. This paper provides an overview of machine learning based OCR technology, including its history, principles, and applications. The paper discusses the challenges and limitations of machine learning based OCR and presents various OCR models based on different feature extraction and classification methods. Specifically, it covers feature extraction methods such as Euclidean distance, HOG, Fourier descriptor, and directional chain code, which are used to improve the accuracy of classification models such as CNN, KNN, ANN, and SVM. The paper also discusses recent advancements in OCR for different languages and how OCR can be integrated with machine learning and AI to understand ancient scripts and convert them to modern languages. The paper concludes with a discussion on the future of multi-lingual OCR and integration with AI and machine learning models, which have the potential to revolutionize the field of OCR. In summary, this paper provides a comprehensive overview of OCR technology, its advancements in various languages and potential for future development.

**Keywords:** Nearest Neighbor, K-Nearest Neighbor, Convolutional Neural Network, Support Vector Machine, Minimum Quadratic Distance Classifier, Artificial Intelligence.

# Analysis of Network on Chip Topologies

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## Abstract

The incorporation of multi-core processors using current technologies is a challenging task as establishing effective communication among distant cores consumes significant time, ultimately diminishing the benefits of multi-core functionality. A new technology called Network on Chip (NoC) has been introduced to address this issue and is considered the future of the semiconductor industry. To develop new multi-core processors that outperform existing processors, it is crucial to compare traditional technologies with NoC. The traditional method faces difficulties implementing multi-core systems effectively and establishing efficient communication among different logic units, making NoC a helpful tool for developing multi-core processors. A detailed study of the NoC architecture is necessary, including the understanding of each component of its basic building blocks, such as topology, flow control mechanisms, routing logic, and router micro-architecture, and their performance comparison. This understanding is critical to select the most appropriate NoC architecture for implementing multi-core processors.

**Keywords:** Network on chip, Network-on-chip topology, Routing Algorithms, Router Architecture.

# Cleanobot: Design of an Autonomous Bot for Cleaning Surfaces Leveraging Deep Learning and IoT Frameworks

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## Abstract

The autonomous cleaning bot is a state-of-the-art robotic system that utilizes advanced cutting-edge technology to automate the cleaning process. This paper presents the design and implementation of an autonomous cleaning bot efficiently and effectively cleans a variety of indoor spaces, from homes to commercial buildings, using a combination of sensors, algorithms, and cleaning tools. The bot is capable of navigating through complex environments and detecting obstacles in its path, making it an ideal solution for areas that require regular cleaning. It also features a user-friendly interface that allows for easy customization of cleaning schedules and zones, as well as real-time monitoring of the bot's progress. The experimentation and results demonstrate the effectiveness of the system in autonomously cleaning and detecting objects. The bot successfully sends captured data to the cloud for analysis, and the results accurately indicate the type of object detected. With its rechargeable battery, modular design, and easy maintenance the autonomous cleaning bot is a cost-effective, efficient, and eco-friendly solution that enhances hygiene and safety standards while reducing the need for human labor. The system's design and implementation have been discussed in detail, including the integration of all hardware components. The proposed system has demonstrated its effectiveness in cleaning and detecting objects autonomously. The paper concludes with potential future improvements and research directions for the autonomous cleaning bot.

**Keywords:** object detection, autonomous cleaning, microcontroller, sensor fusion.

**Paper ID
ICAISC 504**

# Chili Disease Detection and Classification using Various Machine Learning Techniques

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## Abstract

For many developing countries like India the role of the agricultural sector is very significant. Chili has a very high economic value. India is ranked 5th in the production and 1st in exporting chili. Chili is one of the important cash crops of our country but they are vulnerable to various fungal, bacterial, and viral diseases. Among these diseases, the leaves of chili plants are more susceptible to harm, it's one main reason we have considered chili leaves for our study. This paper presents a detailed overview of various chili diseases and the work done in this field till now. Manual detection of diseases is a time consuming and strenuous task for the farmers. In this paper we are introducing various image processing and machine learning techniques for early and efficient detection of diseases in chili leaves. The diagnosis of chili disease by capturing leaf images is a very efficient and affordable system, especially for helping farmers to keep an eye on large plantations.

**Keywords:** chili diseases, deep learning, pre-processing, classification, segmentation, framework.

**Paper ID
ICAISC 511**

# Design and Evaluation of a Deep Learning Aided Approach for Kidney Stone Detection in CT scan Images

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## Abstract

A lot of patients confess to emergency departments with agonizing pain due to kidney stones, which are a prevalent illness across the world. Numerous imaging techniques are used to diagnose kidney stone disease. Specialists are needed for the full diagnosis and analysis of these photographs. The practical methods that may be employed as supplemental tools to aid physicians in their diagnosis are computer-aided diagnostic systems. This study suggests using coronal computed tomography (CT) scans to automatically detect kidney stones (having stones or not), using the deep learning (DL) approach, which has lately made major strides in the field of artificial intelligence. Different cross-sectional CT pictures were taken for each subject, resulting in a total of 12446 images being used. In the model's training phase, 1600 CT images were employed, of which 80% were used for training and 20% for validation. 346 pictures that weren't included in the deep model's training were used to determine test performance values once model training was complete. This detection is constructed using the automated model, its accuracy was 99.82%.

**Keywords:** kidney stone detection, image processing, computerized tomography, deep learning.

# Badminton Action Analysis Using LSTM

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## Abstract

Badminton is a popular racquet sport that involves quick movements, agility, and reflexes. A badminton action analysis is a process in which quantify the various actions performed by the player using various sensors or image processing-based approaches. In this paper, a sensor-based approach to collect player action data for various shots, analyse the same and create a Long short-term memory-based model to classify various shots. The trained Long short-term memory model has a Micro F1 score of 0.84. The Model would then generate a shot accuracy score between 1-10. A professional badminton coach also rated the shots, and a comparison was made between the score given by the coach and the ML model. Additionally, arm section-wise comparison of the shot were made. This allows for a more granular analysis of the shot. A comparison of the arm-wise shot is also conducted. It can be seen from the results that the scores given by the coach and the Long short-term memory-based ML model matched by 98.6%. So it can be concluded that such a sensor-based wearable badminton teaching technique can be deployed to enable underprivileged beginner badminton players to achieve higher shot accuracy by allowing them to correct postures during the swing action of the arm.

Keywords: Badminton, Action Analysis, LSTM, Sports Analysis, Machine Learning, Neural Network.

# Seizure Detection Mechanism in Children

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## Abstract

In this paper, a wearable device is presented which is designed to monitor the vital signs of young children and detect the possibility of a seizure before it occurs. Epilepsy and seizure disorders affect millions of people worldwide, and young children are particularly vulnerable to these conditions. However, it can be challenging for young children to communicate or recognize the symptoms of a seizure, which can lead to under-diagnosis and delayed treatment. The Seizure Tracker device includes an array of sensors - a biometric sensor hub for heart rate, blood pressure, and oxygen saturation, a temperature sensor, and an IMU sensor for jerk detection. The device uses a machine learning algorithm based on support vector machines to analyze the sequential data of a person both under normal and seizure conditions and classify the possibility of a seizure with an accuracy of 84%. The macro F1 score of the model on the test set was 0.8191. The misclassification rate of the model was 0.16.

Keywords: Epilepsy, Seizures in Kids, Epilepsy Alerting device, Biometric sensors, Support Vector Machine.

# Handwritten Digit Detection and Prototyping on Field Programmable Gate Array (FPGA)

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## Abstract

Neural Networks is a subset of Machine Learning (ML) where real-world data and algorithms are used to make the machine learn to mimic the way a human learns. An Extreme Learning Machine (ELM) is a specialized form of those Neural Networks for the training of Single Hidden Layer Feedforward Network (SLFN). The ELM algorithm has been presented to be faster than many other conventional algorithms with acceptable accuracy and good generalized performance. The algorithm allows the learning to be completed in a single step, which is made possible by using a pseudo-inverse matrix instead of back propagation to obtain the trained weights. The system uses random values for its initial set of weights, which are generated using a Linear Feedback Shift Register (LFSR). For the hardware implementation, a 256-bit input register is used to store the image. After the generation of weights, an intermediate signal is set to reset, moving the Finite State Machine (FSM) to the next weight fetching state. When the next set of weights has been calculated, the maximum output is given out through one hot encoding. An ELM is trained to detect handwritten digits from an image. Then a Register transfer level (RTL) is designed and further prototyped on a field programmable gate array (FPGA). Basys 3 is the FPGA board that will be used to implement the design. The one hot encoded output can be observed on the FPGA. The experimental results show a greater software accuracy of 99% and hardware accuracy of 90% in detecting handwritten digits from the dataset.

**Keywords:** Neural Networks, Extreme Learning Machine, Single Layer Feedforward Network, Linear Feedback Shift Register, Finite State Machine, One hot encoding.

# Image Caption Generation using CNN-GRU Approach

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## Abstract

There has been a rise of interest in the topic of picture caption creation in recent years, with the goal of automatically generating human language descriptions of photographs. The approach put forward in this study blends information extracted from a picture using a pre-trained convolutional neural network (CNN) with a gated recurrent unit (GRU) to produce captions. The suggested model is assessed on flickr8k and flickr30k datasets and gets impressive outcomes. The GRU's incorporation enables modelling of long-term word relationships in the output captions. Overall, by effectively collecting contextual information and interactions between items in the image, this method seeks to advance existing image captioning methodologies. Hence, this method helps to create advanced models to give the appropriate and accurate results in caption generation.

**Keywords:** CNN (of convolutional neural networks), RNN (Recurrent Neural Networks), GRU (Gated Recurrent Unit), LSTM (Long Short-Term Memory), Natural language processing.

# Detection of Diabetic Maculopathy

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## Abstract

The macula is an oval-shaped central part of the retina that controls the eye's central vision. Macular degeneration caused by diabetes or age-related macular degeneration can result in blurry vision and even blindness. The macula of the eye is impacted by diabetes-related retinal degeneration known as diabetic macular edema (DME). That could cause serious issues or perhaps result in total blindness. Hence it is very important to understand and treat the problem early. Early detection of diabetic maculopathy (DM) is possible through regular checkups of diabetic patients but the availability of ophthalmologists is significantly less compared to the number of diabetic patients. It has created great interest in the automatic detection of diabetic maculopathy systems. In this paper, we have performed a review of different methods used in the detection of DM along with mentioning its pre-processing techniques and databases used. The results of each method are discussed.

**Keywords:** Diabetic maculopathy, deep learning, machine learning, and digital image processing.

# Impact of Women's Autonomy and Socio-economic Factors on Delivery Assistance in Bangladesh

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## Abstract

The article is focused to derived a method to calculate women's autonomy and selected socio-economic factors including women's basic education or basic literacy, wealth index, newspaper reading practice as well as television watching practice on delivery assistance in Bangladesh. The PLS-SEM technique was employed to meet the objective. The significance of the associations has also been evaluated. The analytical outcomes of the study designated that women's autonomy had a significantly negative impact on delivery assistance whereas the selected socio-economic factors had a significantly positive impact on delivery assistance. Furthermore, the selected socio-economic factors demonstrated a significantly negative effect on women's autonomy in developing countries. PLS-SEM model's reliability is also explained to show the functionality of the model.

**Keywords:** Delivery assistance, women's autonomy, fatality, PLS-SEM, Least-Square.

# Comparative Analysis of Mental Health disorder in Higher Education Students using Predictive Algorithms

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## Abstract

Mental health problem is the biggest problem in the current world. The problem in the case of higher education students is one of the challenging factors. To solve the issue the concern is to collect all the factors then analyses and then implement the methods to find out the cause After getting the full and effective cause , it is also very challenging to implement. But the most effective factor is how the problem can be diagnosed. There are different emerging techniques are developing day to day. But the most effective approaches are to implement machine learning applications or algorithms to detect the solution in an effective manner. This study is based upon the classification tasks. The mental health problems are different types like stress, anxiety or depression etc. The different classification algorithms are implemented over these problems and suitable algorithm is picked as per the performance measurement. The performance evaluation is also done by taking the factors associated with the particular mental health problem. In the study 4 classifications are used as Decision Tree(DT),Logistic Regression(LR),Support Vector Machine(SVM) and Neive Bayes(NB). After successful implementation, different algorithms show different performances. For stress detection Decision Tree algorithm's performance came out as best, while for Anxiety level detection Logistic regression is the out performer. In same way support vector machine works good for depression level calculation. The result shows that machine learning algorithms are best if the input data is trained, tested. Overall, the outcome shows that the methods or machine learning algorithms which are implemented have significant influences. The outcomes can be implemented over the higher education students to detect the mental health problem status. The overall result shows that for stress detection Decision Tree gives 94.4%, Support Vector machine gives result of 91.2% for depression level calculation. For Anxiety level detection, Logistic regression shows 88.76% which is best over all other algorithms.

**Keywords:** Mental Health, Decision Tree, SVM, LR, NB, Stress, Depression, Anxiety.

# Medical Image Retrieval System for Endoscopy Images Using CNN

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## Abstract

Today's technologically advanced period has led to an exponential growth in medical research. Nonetheless, there is still room to use AI to improve research. The process of retrieving an image can be difficult. This paper uses CNN to diagnose GI tract abnormalities from the given endoscopic images by extracting features of each image in the dataset. The proposed method, uses VGG-16 model to construct a feature database from each image in the dataset. By comparison of the features of the query image (which was computed similarly to the dataset images) and the features of the images in the feature database using Cosine Similarity metric to extract images matching to the image of the query. Performance measures, including precision and recall are taken into consideration while evaluating the suggested model's performance. The findings imply that the proposed CNN technique achieves a precision of 83.49, 79.23 and 77.12 for top-10, top-20 and top-30 image retrieval which outperform the other methods currently in use.

**Keywords:** CBIR, CNN, Feature Extraction, Similarity Measure.

# Histone Deacetylase 6 as a putative target in Alzheimer's disease therapeutics

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## Abstract

Degeneration or loss of brain cells called neurons results in several neurodegenerative disorders (NDDs) and currently, millions of people across the world are suffering from them. The increase in the occurrence of these age-related disorders is witnessed majorly due to lifestyle changes. NDDs harm the overall functioning of the body which can also be fatal to life. Alzheimer's Disease (AD) is the most prevalent in the list of NDDs which affects the memory of patients. Oxidative stress performs a wide role in AD pathology and along with that several proteins and enzymes are responsible for the occurrence of AD. One of them is Histone Deacetylase6 (HDAC6). Normally it is responsible for the release of neurotransmitters but in the diseased condition, it becomes abundant in the nucleus which hinders the function and mechanisms and results in dysfunction of the brain. The deteriorated health of the brain leads to AD. This study, utilizing computational-based molecular docking, presents the binding of multiple types of FDA-approved drugs (Anticancer, Antihypertension, Antidiabetic) with the protein for inhibition. To reduce the activity of HDAC6 as a potential therapy for AD, the AutoDock vina-1.5.7 tool was utilized for virtual screening and prediction of the binding affinity of drugs. Following a simulated screening of several different compounds, it was observed that Bicalutamide had the highest binding affinity, measuring -9 kcal/mol. Bicalutamide is an anticancer drug that may be put through additional pre-clinical and clinical testing to produce medications that are repurposed for the treatment of chronic diseases like AD.

**Keywords:** Neurodegenerative diseases, Alzheimer's Disease, Histone Deacetylase6, drug repurposing approach, molecular docking, Bioinformatics.

# Transparent Fundraiser for Projects using Blockchain Technology

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## Abstract

The evolving developments in blockchain technology have helped us in deriving a path through which the community can achieve to develop a healthy platform that is transparent and trustworthy for both investors as well as startups. It is with the help of core logic for handling mechanisms and the brain of blockchain, also known as smart-contract that it utilizes in achieving this goal. The paper presents the implementation of such a logic which helps in achieving the solution to the issues faced by earlier-generation ICOs. The work involves the addition of an extra layer of smart contract wherein the funds will be stored instead of going directly to the owner's account. The money gets transferred only upon receiving majority votes from the investors on the withdrawal request made by the owner. This ensures the money is spent well and the owner doesn't run away with all the stored money.

**Keywords:** KYC (Know your customer), ICO(Initial Coin Offering), DAO(Decentralized Autonomous Organization), STO(Security Token Offering).

## Symmetric and Asymmetric Cryptographic approach based Security Protocol for key Exchange

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## Abstract

Recently, the security of confidential data over any communication channel has gained paramount importance. To tackle the problem of security breach, encryption and decryption techniques are widely used for attaining confidentiality of sensitive information which is transmitted over insecure channels. Symmetric cryptographic algorithms are more secure which use a key for both encryption as well as for decryption process but it  faces a key exchange problem between the transmitter and receiver. This research paper presents a novel approach to address the key exchange issue which is encountered in symmetric encryption cryptographic techniques. A hybrid technique is proposed by using Advanced Encryption Standard (AES) from symmetric cryptography and Rivest Shamir Adleman (RSA) algorithms from asymmetric cryptography are used for designing a new protocol. This protocol achieves two major cryptographic primitives: confidentiality and authentication. The proposed hybrid encryption technique is simulated using Xilinx XST14.7 and encouraging design summary is obtained.

**Keywords:** AES, RSA, Hybrid cryptography, FPGA.

## Classification of Non-Small Cell Lung Cancer using Deep Learning

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## Abstract

Computers can be programmed using Deep learning, a subset of Artificial Intelligence that takes inspiration from the human brain. This approach is quicker and less tedious. The major drawback in the bio medical field is that fewer datasets are available which can lead to overfitting which in turn reduces the accuracy. This can be overcome with the help of data augmentation. The adenocarcinoma (ADC), squamous cell carcinoma (SCC), and large cell carcinoma (LCC), subtypes of Non-Small Cell Lung Cancer are classified using one of the Deep Learning techniques in this study. This is accomplished by utilizing the EfficientNetB2 architecture which consists of 342 layers with additional neurons on top it. The dataset is made up of 1000 CT (Computed Tomography) scan images of lungs, which has been broken down into training (613 images), testing (72 images), and validation (315 images) sets. The training accuracy of 95% and testing accuracy of 83% is obtained.

**Keywords:** Deep Learning, Adenocarcinoma, Squamous cell carcinoma, large cell carcinoma, Computed Tomography.

# Fusion of Vision Based Features for Human Activity Recognition

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## Abstract

The field of image recognition has made significant progress in recent years, particularly in the domain of Human Activity Recognition (HAR). HAR systems use computer vision and machine learning algorithms to classify images into different activities. A review of existing literature in this area was conducted, focusing on a vision-based system for recognition purposes. The present study focuses on recognizing Eating, Walking, and Chitchat activities using a vision-based approach. The dataset consisted of 1306 images, equally divided between the three activities, with around 400-500 per activity. This work has potential applications in surveillance, assisted living, elder care, healthcare monitoring systems, human-robot interactions, and gaming and entertainment. The model can also be embedded for monitoring elderly persons who are living alone and also to keep the track of their activities. The best possible results were obtained by using the Random Forest classifier after using the Fusion of Binary Robust Invariant Scalable Keypoints (BRISK) and Scale Invariant Feature Transform (SIFT) feature detector, with an overall accuracy of 89.41% and the precision of 89.42%, if the fusion of these features is not taken into consideration then solely Random Forest classifier provided the highest accuracy of 86.98% when applied on BRISK extracted features. The main finding of the study is fusion of BRISK and SIFT feature descriptors which showed promising results for all classifiers and they act as a novel approach in this proposed model and research.

Keywords: HAR Computer Vision, Machine Learning, BRISK, SIFT, Fusion.

# Smart Object and Face Detection Assistant for Visually Impaired

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## Abstract

The World Health Organization (WHO) estimates that 253 million people worldwide are blind or visually impaired. 217 million of them have moderate to severe visual impairment, leaving 36 million of them entirely blind. The majority of people who are visually impaired live in low- and middle-income nations, and there is evidence that vision impairment rises with age. Visually challenged people need access to a face and object detection system in order to improve their mobility and capacity for social interaction. The suggested remedy makes use of a Raspberry Pi equipped with a camera module to capture real-time video feeds, OpenCV for image processing, and machine learning techniques for object and face recognition. The proposed methodology includes YOLO Algorithm and Convolutional Neural Network Architecture in implementation. The system is designed to provide real-time feedback to the user via audio and haptic feedback to notify them of the presence of people or objects in their vicinity. The project also includes a user-friendly interface that allows the user to customize the detection

settings to suit their individual needs. The system was tested on various scenarios and showed promising results in terms of accuracy and responsiveness. Overall, the proposed system provides a practical solution for visually impaired individuals to overcome their daily navigation challenges and to improve their quality of life. The results are obtained in both software and hardware implementation.

**Keywords:** Raspberry Pi, OpenCV, YOLO Algorithm, Convolutional Neural Network.

# A Content-Based Study and Tweet Analysis of the Russia-Ukraine Conflict

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## Abstract

Twitter analysis has emerged as a fascinating field of inquiry, and the recent Russia-Ukraine conflict has garnered significant international interest. Twitter users, particularly those from Ukraine, have turned to the platform to share their experiences, seek support, and more. Existing research has predominantly concentrated on sentiment analysis, but there is a rising enthusiasm for exploring social media analysis in greater depth. Thus, this research aims to present a holistic perspective on the situation by employing advanced methodologies such as text cleaning, preprocessing, and visualization. The research findings encompass a comprehensive analysis of the text, including aspects such as word distribution, word length distribution, counting stopwords, analyzing hashtags, examining mentioned users, and visualizing text word clouds. These various techniques were employed to thoroughly investigate and gain insights from the text under study.

**Keywords:** Twitter, Russia, Ukraine, Tweet Analysis, Plots, Wordcloud.

# Design and Analysis of Circular Patch antenna for Microwave Applications

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## Abstract

In this paper, a miniaturized circular patch antenna proposed for conceptual super wideband (SWB) applications. The proposed structure done on inexpensive substrate comprises of the efficient circular radiating patch, feedline, effective rectangular shaped ground plane, and Rogers RO3003 substrate. The proposed design overall dimensions are 60mm x 40mm x 1.52 mm and measures overall electrical size of $0.48\lambda$ x $0.32\lambda$ x $0.012\ \lambda$. Three modifications have been introduced to achieve super wideband characteristics. The first is a rectangular shaped slot in the circular patch, the subsequent method is to alter the ground plane as a half wave ground plane, and the upcoming third modification is to introduce the rectangular shaped slot at the mid of the ground plane (i.e., opposite to the feed). The return loss parameter of the SWB antenna is minimized by etching the slots at the edges of the radiating surface, and the bandwidth of the antenna is improved by reducing the magnitudes of the ground plane to Lg/2, and the obtained gain of the antenna can be more enhanced by introducing rectangular slot in the ground plane at the bottom portion. The designed antenna element operates at the frequency band range of (6.14 – 30.97 GHz) and is maintained with a return loss of - 10dB.

**Keywords:** SWB, Microwave, Circular Patch, Bandwidth, RO3003.

# A Credit Card Fraud Identification Technique using Support Vector Machine

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## Abstract

Transactions using credit card are increasing rapidly due to the advancements in electronic commerce. The clients as well as merchants are seriously affected by frauds in modern days and that causes high commercial losses. To minimize this loss, financial institution and banks requires a fraud detection system. Random Forests (RF) approach is method to developed for detecting fraud's in credit card. In this method, training about abnormal and normal transactions is done using CART-based Random Forest (CARTRF) and Random-Tree-Based Random Forest (RTBRF). Complexity of this system made difficulties in the usage. This system requires large computational resources and they are harder and lea intuitive. To improve the accuracy with high true positive rate, Support Vector Machine (SVM) is proposed. From Taiwan and German dataset, default data of credit card client's are collected and preprocessed.   Attributes are normalized using min-max normalization. Attribute selection based on Information Gain (IG) is used for reducing feature set. Frequent attribute selection and pruning are performed using Aprori algorithm. Candidate's itemset size is reduced by this and improved performance gain is produced. Support Vector Machine (SVM) performs detection of fraud's in credit card using frequent attribute set. The parameters like recall, precision, detection rate and pruning time are used to compare performance of proposed method against existing methods like CART-based random forest approaches and Random-tree-based random forest approach. Experimental results show better performance of proposed technique.

**Keywords:** Support Vector Machine (SVM), Apriori algorithm, Information Gain (IG) and credit card fraud detection.

# Power Effective Multiply Accumulation Configuration for Low Power Applications using Modified Parallel Prefix Adders

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## Abstract

This article illustrates low-power design and equally divisible design configurations byusing modified bit-parallel ripple-carry adder. Power storage elements with broad definitions include adders, accumulators, and multipliers. The multipliers in this review are Vedic multipliers, while the parallel prefix adders are actually Brent-Kung adders, Kogge-Stone adders, hybrid Han-Carlson adders, and Han-Carlson adders. Using the toggle threshold prototype's exclusive-or input can be achieved by pre-multiplier- and pre-adder phases for marketing XOR procedures. To add item sets, multiplication is used as correlation correction adder. The achievement of a large number of equally divisible configurations is rewarded with authority and a figure of merit. The suggested redesigned sum-of-products unit cuts the power consumption considerably while improving the figure of merit. Various architectures are designed using the Verilog Hardware Description Language. Xilinx Vivado Design Suite 2015 is used to simulate and synthesize the model. 2 at speed level -1 for the target device xc7a100tcsg324-1 and the Artix-7 Field Programmable Gate Array family.

**Keywords:** Verilog HDL, Xilinx Vivado design suite, Brent Kung adder, Han Carlson adder, Hybrid Han Carlson adder, Kogge Stone adder, Multiply accumulate, Parallel prefix adder.

# Unlocking the Potential of BI-Enhancing Banking Transactions Through AI&ML Tools

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## Abstract

The study's aims to investigate the effect of business intelligence systems on the bank operative efficiency and profitability insights. A simple random sampling method is employed to gather 385 responses from 33 commercial bank branches, which served as the basis for the study. The propositions are confirmed through application the partial least squares structural equation modelling method in this study. The measurement model's reliability and validity as well as the structural model's fitness are checked in this study. Further, the review uncovers that functional productivity through business insight decidedly influences bank's benefit. According to this study, business intelligence enables the firm to earn good returns than their competitors. This claim is based on competitive theory. As a result, banks can ensure a competitive advantage by offering better options at a lower cost than their rivals. In addition, the study contends that, according to resource-based view theory, the business intelligence-based applications by banker can help to improve banks abilities as well as results over time. As a result, the study suggests that artificial intelligence-based business intelligence systems must be applied in banking businesses and improves the efficiency of bank management, academics, and policymakers' decision-making.

**Keywords:** Business information, effectiveness of operations, profitability, financial technology, business intelligence applications.

# Fast Charging for Electric Vehicles: Power Converter Topologies and their Control Methods

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## Abstract

The paper provides a comprehensive review of the state-of-the-art power electronic converters for EV off-board chargers. The authors emphasize the importance of developing high-power, low-cost, and reliable charging solutions for EV batteries, which are essential for the wide-scale adoption of EVs. The paper highlights the advantages of using off-board chargers for DC fast and ultra-fast charging. These chargers are located outside the vehicle, which reduces the weight and volume of the EV. The paper provides a detailed analysis of the current state-of-the-art topologies and control methods of DC-DC power stages for off-board chargers. The authors discuss various techniques used to improve the efficiency and performance of these power stages, such as soft-switching, interleaving, and resonant converters. The paper also highlights ongoing progress in the development of off-board chargers and control methods. Finally, the paper identifies several challenges in developing EV off-board chargers, such as thermal management, reliability, and safety. The authors discuss potential solutions to these challenges and suggest future research directions in the field of EV charging. Overall, the paper provides a comprehensive overview of the current state-of-the-art power electronic converters for EV off-board chargers, highlighting ongoing progress and challenges in the field.

**Keywords:** EV fast chargers, DC-DC, multiport converter, electric vehicle (EV), off-board charger.

<table>
<tr><td>**Paper ID**<br>**ICAISC 703**</td><td>## Automated Early Diagnosis of Lung Tumor Based on Deep Learning Algorithms</td></tr>
</table>

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## Abstract

The main goals of this study are to identify the early stages of lung cancer and investigate the degree of accuracy of various machine learning algorithms. A thorough review of the literature revealed that certain classifiers have low accuracy while others have higher accuracy but are challenging to approach nearer to 100%. Low accuracy and high implementation costs as a result of inappropriate DICOM image handling Many various types of images are utilised in medical image processing, however CT scans are typically chosen since they have less noise. Deep learning has been shown to be the most effective technique for processing medical images, identifying and classifying lung nodules, extracting features, and predicting the stage of lung cancer. This system's initial stage employed image processing methods to separate lung sections. Using K Means, the segmentation is carried out. Segmented images are used to extract the features, which are then classified using a variety of machine learning algorithms. The accuracy, sensitivity, and specificity of the proposed techniques, as well as their classification time, are used to assess their performance.

**Keywords:** K-means, CNN and deep learning.

<table>
<tr><td>**Paper ID**<br>**ICAISC 704**</td><td>## Optimization-Based Collision Avoidance in Underwater Wireless Sensor Network</td></tr>
</table>

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## Abstract

The Underwater Wireless Sensor Network (UWSN) is crucial for private, military, and commercial maritime operations, like environmental monitoring, underwater research, scientific data collection, and underwater wireless communications. The existing protocols for Terrestrial Wireless Sensor Networks (TWSNs) could be better in terms of power efficiency, reliability, and effectiveness. Due to their unique characteristics. The energy-efficient convergent depth variation routing (ECDVR) algorithm is introduced to evaluate and reduce power consumption by calculating the distance between each node point and node depth variation. This algorithm considers the two-hop neighbour depth variation when sending data to a neighbor node with a higher forward angle toward the receiver. It calculates the receive time contribution of the Adaptive Time Difference of Arrival (ATDoA). Adaptive Time Difference of Arrival (ATDoA) The arrival time of a signal makes it simple to estimate the time difference between two signals at a node. The storage node-to-receiver approach is the one that has been proposed for determining the node's remaining power for each information exchange. In the subsequent UWSN transmission, the sink allocates the node's higher power when the node reduces its power. Extending the packet's lifetime and shortening the time it takes to reach its destination boosts system performance. It outperforms the compared algorithms regarding node lifetime, dead node count, power consumption, and propagation delay.

**Keywords:** Adaptive Time Difference of Arrival (ATDoA), Energy Efficiency Convex Depth Variance Routing (ECDVR) algorithm, Shortest Propagation Delay-Based (SPDB).

# Mobility-Based Optimized Multipath Routing Protocol on Optimal Link State Routing in MANET

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## Abstract

Mobile Ad-hoc Networks (MANETs) connect a mobile node for transferring data from a source to a destination. Mobile nodes because no infrastructure network communicates through wireless without an access point. MANET does not have a centralized controller and has a dynamic network topology, which increases link failure and energy consumption resulting in excessive path delay, loss of Quality of service (QoS), and reduced throughput during data communication. Congestion is a significant problem when the QoS of the link carrying the data is degraded. Routing is one of the main problems of MANET due to the very dynamic and distributed nature of MANET. This research proposes a Mobility-Based Optimized Multipath Routing Protocol (MBOMRP) and an Efficient, Reliable Link-State Transmission (ERLST) algorithm to overcome these problems. The proposed Mobility-Based Optimized Multipath Routing Protocol (MBOMRP) is utilized for route discovery and maintenance to avoid traffic and sleeping nodes efficiently. ERLST algorithm is used for efficient data transmission to improve QoS parameters such as throughput packet delivery rate and minimize end-to-end latency performance. The proposed MBOMRP-ERLST algorithm improves data communication network lifetime, avoids link failures, and provides efficient results compared with previous algorithms.

**Keywords:** Optimized Multipath Routing Protocol, optimal link-state routing, Quality of service (QoS), Mobility-Based Optimized Multipath Routing Protocol (MBOMRP), Mobile Ad-hoc Networks (MANETs).

# Malware Detection using the Machine Learning based Modified Partial Swarm Optimization Approach

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## Abstract

Malware analysis includes a crucial step after malware detection called malware categorization, which classifies dangerous files. There have been many reported static and dynamic methods for classifying malware up to this point. The ML-MD strategy presented in this study uses static methods to categorise various malware families and is based on machine learning. In order to detect malware, we create a new machine learning-based framework. The characteristics from the dataset are extracted in this case using principal component analysis (PCA). In order to offer the best malware detection solutions, introduce a machine learning-based Modified Particle Swarm Optimization (MPSO) algorithm. Improved Accuracy and detection rate using ML-based MPSO technique. The effectiveness of the suggested technique in detecting malware is demonstrated by the experimental results on several benchmark data sets, which greatly outperform alternative approaches.

**Keywords:** Machine Learning, Malware Detection, Particle Swarm Optimization (PSO), Optimal Solutions.

# Machine learning approach for detecting liver tumours in CT images using the Gray Level Co-Occurrence Metrix

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## Abstract

Over 2.4% of deaths in India each year are caused by liver diseases. Due to its mild early signs, liver disease is also challenging to diagnose. Frequently, the signs only become obvious when it is too late. Even more challenging than segmenting the liver is segmenting the tumour from the liver. Imaging procedures like computed tomography, magnetic resonance imaging, and ultrasound are utilised to separate the liver and liver tumour once a sample of liver tissue has been removed. This research suggests a machine learning method from CT images-based automatic assistance system for stage categorization. Then, the features are extracted from the CT images using the Gray-Level Co-Occurrence Matrix (GLCM) method. Finally, it is suggested that the computed tomography (CT) pictures of livers containing tumours be categorised using a Random Forest technique. Using the described method, liver tumour images are classified as benign or malignant. The real value accuracy for liver segmentation was found to be approximately 99.55%, 97.85%, and 98.16% based on the experimental investigation. Using the described method, liver tumour images are classified as benign or malignant. These modifications improve the system's ability to recognise the tumour from the CT pictures.

**Keywords:** Computed Tomography (CT), Random Forest, Machine learning, liver tumours, Gray-Level Co-Occurrence Matrix.

# IoT based Smart agriculture monitoring using Support Vector Machine

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## Abstract

Agricultural environment monitoring systems based on several wireless sensors have been created to ensure optimal growth conditions. IoT sensing monitoring the agriculture area to transmit the data through wireless sensor medium. To make better analysis to monitor the agriculture filed to improve the cultivation based on machine learning approach. Various improper data analysis failed to predict the data. To resolve this problem, we propose a IoT based Smart agriculture monitoring using Support Vector Machine (SVM). This proposed system develops a multi-parameter monitoring system that will deliver real-time data to farmers and users over the internet. It consolidates the Internet of Things (IoT) and remote sensor networks in an innovative way to develop an intelligent remote agricultural monitoring system. Sensor hubs are decisively positioned throughout the field to gather information on innumerable targets. These readings are then displayed on the transmitter before leaving the base station via the XBee sensor. Organization and made a data set to screen sensor values. It can be used for ecological research and analysis. This proposed system produce higher performance compared to the other system.

**Keywords:** IoT, data analysis, agriculture sector, prediction feature selection, SVM classification charger.

# Detection of Denial of Service Attacks Using SNMP-MIB in Internet of Things Environment

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## Abstract

The Internet is a vast system of interconnected networks that provide a variety of services. More than a million people join the World Wide Webs every day, making it a powerful force. Approximately 70% of businesses are considering making the switch to cloud services due to the many benefits and pay-as-you-go structure of cloud computing. DoS attacks, which interrupt internet services, are a common kind of cybercrime. Distributed DoS assaults (or DDoS for short) happen when the same DoS comes in from several different places at once. DoS severely destroys the availability limitation of online services, hence early detection is crucial. The DoS attack type known as TCPSYN causes the TCP protocol's connection setup procedure to fail, leading to partially open connections. TCP-SYN is used to force a web server to crash by using up all of its resources. Despite ongoing efforts at repair, attacks against TCP-SYN continue to increase in frequency and sophistication. Therefore, in today's digital environment, it is envisaged that the solution would completely mitigate such threats. A multi-level detection strategy that integrates SNMP and incoming request analysis is offered as a means to early detection and cost-effectiveness. The basic goal of SNMP is to achieve maximum effectiveness in distinguishing TCP-SYN from valid traffic in a shorter time span. Using the SNMP Management Information Base (MIB) variables, a TCP-SYN attack may be spotted in two stages. Theoretical validation is used to determine which MIBs should be used, and feature selection approaches have been verified using the prediction and accuracy metrics of linear regression.

**Keywords:** Internet, attacks, protocols.

# A Kannada Handwritten Character Recognition System Exploiting Machine Learning Approach

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## Abstract

Handwritten character recognition plays an important role when the handwritten text on paper, postcards, etc. requires conversion of the handwritten text into digitized form. The difference between a digitized handwritten document and a scanned document is that the prior one can be edited, and the latter cannot. Significant developments have been made on the handwritten character recognition of widely used languages like English. India is a multilingual country where there exist multiple regional languages like Kannada, Tamil, Malayalam and other Dravidian Languages with complex scripts. Kannada is spoken in most of the regions of Karnataka State, which is one of the southern regions of India. In the proposed research, a Convolutional Neural Network(CNN) is practiced to recognize Kannada handwritten Characters. The research employs densely connected-convolutional networks or DenseNet variant of CNN to recognize handwritten Kannada characters. DenseNet is preferred in this research for its known advantages such as enhanced feature propagation, improved feature reuse, and minimized vanishing gradient problem. The dataset used in the experimentation is a standard Char74k dataset. The prime objective of this research is to devise a machine learning based application to recognize Kannada handwritten characters with high accuracy and convert them into digitized characters. Digitized documents promote the growth of several other major applications like speech conversion, language translation and conversion of medieval documents. A testing accuracy of 93.87% is observed for 3285 images of handwritten Kannada characters with 5 images from each of the 657 classes. This machine learning model can also be trained to recognize characters of different Indian languages.

**Keywords:** Handwritten Character Recognition, Kannada; Convolution Neural Network, DenseNet, Machine Learning.

# Malware Detection and Classification with Deep Learning Models

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## Abstract

Due to an explosion in connected devices, network ecosystems are more vulnerable to attacks from a wide range of malicious actors. To make the most accurate prediction of network virus, this study designs and simulates a system for retrieving and analysing network data using methods centred on machine learning. Using Wireshark as a packet capturing tool, we retrieve network data from the WLAN environment and generate file. In this study, data training is carried out using Proposed Deep Learning Networks (PDL). To reach the ultimate goal of predicting network infection, this study designs and simulates fetching and analytics of network data using machine learning based methodologies. The network has been fetched. Wireshark is used to capture data from a wireless local area network (WLAN) traffic and produces a.pcap file. In this study, we use both the support vector machine and random forest methods for data training. The support vector machine technique is an established method with a history of successful use. Since deep learning is one of the most well-liked methods for machine learning and classification, we've chosen it to outperform Artificial Neural Networks (ANNs) and similar techniques when it comes to predicting malware in the current research network's traffic. Once results from the various methods have been gathered, the overall accuracy and associated aspects may be assessed properly. The support vector machine technique is an established method with a history of successful use. As deep learning is one of the most well-liked methods for machine learning and classification, proposed work have chosen it to anticipate malware in the present research network's traffic rather than Artificial Neural Networks (ANNs) or comparable techniques. The overall accuracy and associated criteria are examined competently after the results acquired from the techniques are identified. Users of wireless networks, such as Wi-Fi, are particularly at risk from malware and hence need solutions such as deep learning. User connections to public Wi-Fi hotspots without validation of traffic and sniffing efforts need quiet attention and care against viruses. Connected devices from the public hotspots are often monitored. Improving the precision with which malware may be detected in the wireless environment requires further development of machine learning and information exploration methods. Focusing on forecasting random network traffic allows for more precise prediction of attacks, which is the primary goal of this research. To get such multifaceted results, the study effort blends the use of numerous methods, such as the Random Forest Method, the Support Vector Classifier, and Deep Learning. A total of 16,489 malicious and 8,422 safe files were used in the development of the suggested method. Using a Deep Learning algorithm, we were able to successfully identify malware 99.54 % of the time in our experiments.

**Keywords:** Deep Learning (DL); Artificial Neural Network (ANN); Malware; Wi-Fi; Benign; Support Vector Classifier.

# Multisalient Object Detection and Recognition Using Deep Learning Techniques

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## Abstract

This paper describes the idea of how multisalient object detection and recognition are done using deep learning technologies. The important problem that is faced in Computer Vision and Image processing is detecting objects' position. Salient object detection has complexity due to diverse effects such as light and weather conditions. For that, a new method is proposed for object detection and recognition based on deep learning techniques. The proposed methodology explores the method to detect a salient object in a frame using deep learning methods. For the purpose of retrieving the desired region, Multiobject detection algorithms use a variety of image processing applications. Applications including image retrieval, security, the medical field, and the military frequently employ it. Consider employing deep learning methods to recognize and classify several objects in this project. Classification Object Using DNN (Deep Neural Networks), multiobject identification entails training a neural network model to recognize and find numerous objects in an image. The duties of object classification and object localization are carried out during object detection. The classification and detection of objects have been effectively accomplished using deep neural networks (DNN). MobileNets are also used in this system which is helpful in the detection of objects in the fastest way. Hence by using this system, object detection is done in a more efficient way.

**Keywords:** Multiple object detection, Object recognition, Deep learning, DNN, MobileNet

# Design and Analysis of 5G antenna with Defective Ground Structure

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## Abstract

Person's life becomes live because of the communication between them, even they are close to each other or separated apart. With the development in the technology for devising the communication equipment's, the communication has become fast and simplest. Antenna is one of the most important electronic elements used to make the communication alive. The antenna is essential in allowing people to communicate with one another. Among the various types of antenna present, based on the simple design, low cost, small size and reliability, micro strip patch antennas have attracted the designers much. The goal of this research is to create a miniature antenna for future mobile and wireless communication standards such as 5G. A new type of DGS antenna for future mobile is designed in this paper. Initially, in this research, the design and the fabrication of the patch antenna to resonate at 4 GHz with Defected Ground Structures (DGS) have been performed using a single substrate layer and the results were obtained.

**Keywords:** Microstrip patch antenna, Defective Ground Structure, Frequency, Gain, Radiation Pattern.

**Paper ID
ICAISC 742**

# Analysis of ECG Noise Cancellation and Abnormality Classification Using Various Adaptive Algorithms

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## Abstract

Noise cancellation and abnormality detection in ECG signal is a tedious task in real time environment. These noise arise due to power line interference and human movements. There are various digital filters readily available to reduce noise in ECG signal but the computational cost and complexity is high. To overcome this drawback, adaptive filters are introduced and abnormal ECG signal is also detected using adaptive algorithms. This paper talks about multilevel pipelining and cutest retiming techniques in adaptive filters, for example, LMS (Least mean square), BLMS (Block LMS), NLMS (Normalized LMS), BNLMS (Block NLMS), VSLMS (Variable advance size LMS) and BVSLMS (Block VSLMS) calculations. This paper also classifies various abnormal ECG signal and detects the type of disease. It is observed that there is 15% increase in SNR and 3% reduction in MSE compared to the conventional algorithms.

**Keywords:** Adaptive filters, MMSE, SNR, ECG, Adaptation delay.

**Paper ID
ICAISC 743**

# The Voiceless Assistant for the Specially Abled

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## Abstract

A novel system aimed at bridging the communication gap between deaf and blind individuals and those who are not familiar with sign language or Braille is proposed. Google's Speech Recognition library is used to convert speech to text and the pyttsx3 library is used to convert text to speech. The system is designed to interconvert between Indian sign language, Braille, and English text, creating a unified platform for individuals with different disabilities to communicate effectively. The sign language recognition component of the system was trained with a training accuracy of 97.73 percent and test accuracy of 98 percent. The Braille recognition component was trained with a training accuracy of 97 percent and test accuracy of 95.5 percent. The integration of sign language and Braille into one platform is a unique feature that sets this system apart from existing solutions.

**Keywords:** Indian sign language recognition, Braille recognition, speech recognition, machine learning algorithms, convolution neural network.

**Paper ID
ICAISC 746**

# Early Detection of COVID-19 with Impact on Cardiovascular Complications using CNN Utilising Pre-Processed Chest X-Ray Images

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## Abstract

Using pre-processed chest X-ray pictures and convolutional neural networks (CNN) with canny edge detection, this research presents a new technique for the early diagnosis of cardiovascular problems in patients with COVID-19. The chest X-ray pictures is first extracted using pre-processing methods, such as image normalization and segmentation, as part of the suggested approach. After that, edge detection is used in order to accentuate the edges of the heart and blood arteries, both of which are essential characteristics for cardiovascular examination. Then, a CNN model is trained on the pre-processed pictures to categorize them as normal or abnormal depending on the presence or lack of cardiovascular issues. This classification is based on with or without cardiovascular complications. The suggested procedure was tested using a dataset of 500 chest X-ray pictures, which included 250 normal cases and 250 abnormal cases respectively. According to the findings, the proposed model was able to obtain an accuracy of 99% when categorizing chest X-ray images as normal or abnormal, suggesting that it has the potential to aid in the early diagnosis of cardiovascular problems in patients with COVID-19. Overall, the proposed approach provides a promising solution for the early detection of cardiovascular complications in COVID-19 patients using pre-processed chest X-ray images and CNN with canny edge detection. This could help in early intervention and treatment of cardiovascular complications in COVID-19 patients, thereby improving their overall prognosis and reducing the burden on healthcare systems.

Keywords: cardiovascular, X-ray-images, canny edge detection, Convolutional Neural Network (CNN), COVID-19.

**Paper ID
ICAISC 747**

# Examining the Potential of Cryptocurrencies as an Asset Class: An Empirical Study

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## Abstract

The market for virtual currencies in India rose from USD 926 a million during 2020 to USD 15 billion in January 2023. As reported by regulatory bodies, cryptocurrencies popularity has grown by eight hundred percent just this time last year. This study aims to find the effect of utility, user-friendliness of investment and effect of risk in trade on investors behavior (IB) with regard to cryptocurrencies. Digital currencies are an innovative kind of asset that has arisen. Because of its exceptional growth in value, Generation Y are turning to digital currencies as a means of investing. The Technology Acceptance Model is used in this article to investigate cryptocurrency uptake. A structured closed ended questionnaires are used to collect the responses. A user's opinion is collected based on three parameters: utility, convenience with application, and safety. For collecting information, 185 investors were consulted by provided with questionnaires that they can complete the filling of responses by themselves. The respondents were chosen according to their readiness to participate in the survey. Convergent and discriminant Validity, reliability analysis and SEM model were used to analyze the data to find the results. The utility, utility, user-friendliness of investment and management of risk in trade are all having a major impact on behavioral patterns among investors while engage with cryptocurrency, according to the findings. This study contributions will help firms to comprehend users' sensitivities with regard to cryptocurrencies and set various variables that influence its acceptance while delivering digital currency services to ease investment in better manner.

Keywords: SEM model, Asset Category, Blockchain technology, Cryptocurrencies, Technology Acceptance Model.

# Corona Virus Chest CT Scan Classification Using Deep Learning

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## Abstract

People can perceive an occasion from this project investigates how well profound learning models prepared on chest CT pictures can analyze Coronavirus tainted individuals in a quick and mechanized process. To this end, we embraced progressed profound organization structures and proposed a consecutive convolutional brain organization to accomplish the best presentation. We led broad arrangements of tests on two CT picture datasets, specifically, the SARS-CoV-2 CT-filter and the Coronavirus CT. The outcomes illustrate predominant exhibitions for our models contrasted and past investigations. Our best models accomplished normal exactness, accuracy, review, and F1-score upsides of 99.2%, 93.9%, 92.0%, 92.9. For better understandable of the outcomes, applied perception procedures to give graphic clarifications to models' expectations. Include perceptions of the learned elements show all around isolated bunches addressing CT pictures of Coronavirus and non-Coronavirus cases. Additionally, the representations demonstrate that our models are equipped for recognizing Coronavirus cases as well as give precise confinement of the Coronavirus related locales, as shown by thoroughly prepared radiologists.

Keywords: corona virus, CT Scan, Deep Learning, Visualization, Localization.

# Big Data Anaytics in Small and Medium Enterprises

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## Abstract

This study will test the presumption of autonomy on the part of Technological, Organisational, & Environmental (TOE) variables and will examine the effect that the TOE factors have upon the application of Big Data Analytics (BDA) amongst medium- and small-sized organisations (SMEs). The goal of this inquiry is to evaluate the premise of autonomy on the part of the Technological, Organisational, & Environmental (TOE) factors. It's possible that having support from top management might act as a mediator between the adoption of BDA and its technical and organisational components. In addition to this, the impact that environmental factors have may be seen in The inquiry and analysis concentrated on determining the connection between BDA adoption and factors such as relative benefits, compatibility, competitiveness, organisational preparedness, and organisational readiness. Method- Using structural equation modelling (SEM), the data that were obtained from small and medium businesses manufacturing companies were examined. Conclusions – The findings from the research, which led to the conclusions that were obtained, served to confirm the connections among the TOE components. The support from upper management was the medium that was used to establish the links between BDA adoption and compatibility, competitiveness, and and organisational preparation. In addition, environmental factors have a moderating role in the impacts that compatibility & organisational preparation have upon top management support. These effects are moderated by the fact that environmental factors exist.

Keywords: Big data analytics, Utilisation of Technology, Aspects of the Environment, Top management support, Medium-sized businesses.

# Forecasting Electricity Price using Convolutional Neural Networks with Chicken Swarm Optimization Algorithm

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## Abstract

Forecasting electricity prices is critical to the efficient operation and planning of power systems, allowing market actors, governments, and consumers to make educated decisions. This abstract provides an overview of a thorough examination and comparison of power price forecasting strategies. This paper proposes a Deep Learning model using Convolutional Neural Networks (CNN) with the Chicken Swarm Optimization Algorithm (CSOA) to anticipate changes in the price of power in Australia's grid. It evaluates them in relation to other cutting-edge models. The CNN architecture is intended to extract hierarchical features from input data by leveraging its capacity to learn spatial and temporal connections. Backpropagation trains the model, adjusting the network's weights and biases to decrease predicting error. The CSO algorithm improves the optimization process and prevents the CNN from becoming trapped in local optima. CSO uses a population-based search technique to efficiently explore the solution space inspired by the collective behaviors of chickens. We have selected indicators for evaluation that will show how our model outperforms the state-of-the-art approaches at predicting future electricity costs.

**Keywords:** Forecasting Electricity Price, Machine learning (ML), Convolutional Neural Networks (CNN), Chicken Swarm Optimization (CSO).

# Forecasting of E-Commerce System for Sale Prediction Using Deep Learning Modified Neural Networks

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## Abstract

E-commerce is the practice of purchasing and selling goods over the Internet. Customers will appreciate the simplicity of not having to make physical purchases using primary commerce. They will order the item online and deliver it to their home as soon as feasible. This research aimed to create deep learning algorithms capable of forecasting e-commerce sales. This project aims to develop and test a model for predicting online product sales over a wide range of online product types. It bases its decisions on the requirements for online product sales, the factors influencing online product sales in various industries, and the benefits of the deep learning algorithm. A continuous Stochastic Fractal Search (SFS) method for optimizing the parameters of a deep learning modified neural network (DLMNN) is introduced in this paper. In e-commerce demand forecasting studies, a time series dataset is also analyzed. The DLMNN model's performance improvements across multiple product categories are illustrated using a non-deep learning model as a baseline comparison. The experiment also shows that the unsupervised pretrained DLMNN model outperforms the competition in terms of sales predictions. For root mean square error, the proposed technique obtained RMSE, Mean, and Standard Deviation.

**Keywords:** E-commerce system, forecasting, deep learning modified neural networks (DLMNN), deep learning.

# Artificial Neural Network (ANN) With Chan-Vese(CV) Algorithm-Based Plant Disease Detection And Classification

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## Abstract

A country's economy is influenced by a wide range of factors, with the agriculture, service, and food processing sectors. In our country, agriculture is one of the most significant economic sectors. The agriculture sector, however, has several difficulties, such as the different climatic conditions in other regions of our country that give rise to various infectious diseases in different plant species, resulting in a significant drop in crop productivity and income generation. Early and accurate plant disease diagnosis is crucial in improving the foundation for harvest formation. The traditional method of plant disease detection through eye observation is unsuccessful since it necessitates knowledge. Machine learning (ML) techniques are being utilized to identify and categorize plant ailments to address this issue. In this work, plant diseases can be classified using machine learning methods. These involve classifier training, classification, and stages like dataset construction, image loading, pre-processing, segmentation, and feature extraction. An artificial neural network is initially used to distinguish and find leaves in a challenging environment. The Chan-Vese (CV) technique states that symptoms can be found in images that have been segmented depending on the outcomes of the ANN algorithm. A transfer learning model trained on a dataset of ill leaves on an essential background is then given the segmented leaves. The model is also checked for rust, black rot, and bacterial plaque conditions. The findings demonstrate that the methodology is more accurate—98.22%—than the previous approach, minimizing the adverse effects of illness on agricultural productivity and promoting long-term agrarian growth. Utilizing data from PlantVillage, the model is trained and validated. The dataset includes images of plant diseases afflicting pepper, tomato, and potato plants. Fifteen different plant disease categories are used to train and evaluate the classifier. The results of the trials show that the proposed ANNCVA deep learning model can categorize the numerous varieties of plant leaves accurately and effectively.

**Keywords:** plant disease diagnosis, machine learning (ML), artificial neural network (ANN), cv algorithm.

# The Future of Travel in public Bus Service: How a Mobile Bus Ticketing System is Revolutionizing the Public Travel

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## Abstract

Local bus tickets are an essential part of many people's daily commute, providing a convenient and costeffective mode of transportation. However, issues such as maintaining a balance on the ticket, validating it correctly, and Balance amount collection can sometimes be challenging for passengers. An online bus ticketing system is a platform that allows users to purchase bus tickets online. It streamlines the traditional manual process of bus ticket processing system. This paper explores all such issues and provide helpful insights to ensure a smooth and hassle-free experience when using local bus tickets. The system typically includes features such as selecting the destination in the specified route, payment processing, ticket confirmation, and email or SMS notifications along with validation. The system also includes cancellation of ticket if required and repayment process.

**Keywords:** Mobile Bus Ticketing System, Public Bus Service, Bus tracking and Ticketing, Online Bus Ticketing System, Public Transport Ticketing & tracking system, Mobile Ticketing and Tracking.

# Deep Learning Algorithm for Brain Tumor Detection and Classification using MRI Images

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## Abstract

Brain tumor classification is beneficial for identifying and diagnosing the tumor's specific location. According to the medical imaging system, early diagnosis and categorization of a tumor extend a person's life. Clinical specialists rely heavily on magnetic resonance imaging (MRI) among numerous imaging modalities since it provides contrast information on brain malignancies. The primary purpose of this project is to use a competent automated approach that improves tumour identification accuracy. Several segmentation strategies have been developed throughout the years to achieve and improve the categorization precision of brain tumours. Brain picture segmentation has long been recognised as a difficult and time-consuming aspect of medical image processing. This method for detecting brain tumors Brain pictures are classified using the Full Resolution Convolutional Network (FRCN) classification architecture after pre-processing and segmentation. This study presents a Full Resolution Convolutional Network (FRCN) with Support Vector Machine (SVM) approach for detecting tumors on MRI scans. The procedure is broken down into four steps. In the first phase, the anisotropic filter is utilized to pre-process raw MRI images, followed by segmentation using the Support vector machine (SVM) and skull classification. The singular value decomposition and primary component analysis operations are performed in the third step. Tumors are then detected and classified using the Full Resolution Convolutional Network (FRCN) approach. Simultaneously, the Support Vector Machine (SVM) technique is employed to improve the classification precision of the study model. The experimental results showed an amazing accuracy rate of nearly 100% in detecting both normal and diseased tissues from brain MR images, confirming the efficacy of the suggested technique.

**Keywords:** Brain tumor, medical imaging, Segmentation, Full Resolution Convolutional Network (FRCN), Support vector machine (SVM).

# LipReadNet: A Deep Learning Approach to Lip Reading

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## Abstract

LipReadNet is a deep learning approach to lip reading that aims to improve speech recognition technology for individuals with hearing impairments or in noisy environments. Lip reading has long been known as an effective method of communication for people who have hearing problems, and with the advancement of deep learning algorithms, it has become possible to automate the process of lip reading. The LipReadNet model has the potential to revolutionize the field of speech recognition technology, making it more accessible and useful for individuals with hearing impairments, as well as in scenarios where the audio signal is degraded or absent. The LipReadNet model comprises a 3D CNN and LSTM that is trained on large datasets of video and audio recordings. The model first extracts visual features from the mouth region of a person's face, then combines these features with the corresponding audio signal to predict the spoken words. This approach is highly effective as it can recognize spoken words even in cases where the audio signal is corrupted or missing entirely. LipReadNet outperforms existing lip-reading models in terms of accuracy, robustness, and efficiency. The goal of a lip-reading project is to develop a system that can accurately recognize speech through visual cues, without the use of audio. Achieved accuracy of 93% in a lip-reading project which rely on different factors, such as quality of data and diversity of data of training, the choice of machine learning algorithms, and the evaluation metrics used to calculate the competence of the system.

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## Communication Through Smart Glasses- An IOT Based Eye Blink Detection

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## Abstract

Eye blinking is the rapid closure and opening of the eyelids. Research on human eyesight health has many uses, including eye blink detection in human computer interface. To evaluate the, this research provides an adaptive sensor-based eye blink detection system. Many medical conditions, including Locked in Syndrome, Cerebral Palsy, and Amyotrophic Lateral Sclerosis, cause motor speech disorders or paralysis that impair speech or voice production. The sufferer can become unable to communicate with those around them as a result. People in these situations are aware of what they want to say but are unable to express it. The quick closure and opening of the eyelids is known as eye blinking. Eye blink detection in human computer interfaces is one of the many applications for research on human vision health. This research offers an adaptive sensor-based eye blink detection method to analyse the codewords. Many illnesses, such as Locked-in Syndrome, Cerebral Palsy, and Amyotrophic Lateral Sclerosis, result in motor speech disorders or paralysis that affect the ability to speak or express one's voice. As a result, the affected person may lose their ability to communicate with those around them. In these circumstances, people know what they want to say but are unable to say it.

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## Redefining the Performance Management using Emotional Artificial Intelligence

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## Abstract

Over the last two decades, the relevant literature has focused a lot on the human intelligence of (EI) and the machine intelligence of AI. The present research integrates these two schools of thinking and examines how employee retention and productivity are impacted by mental agility and artificial intelligence. How successfully individuals execute tasks during their internal and external services contacts with clients and colleagues, respectively. These interactions may take place either internally or outside and are categorized as either internal or external. The research demonstrates that emotive artificial intelligence has a major effect on both the performance of employees and their retention rates.

# Mitigation of DDoS Attacks in SDN using Access Control List, Entropy and Puzzle-based Mechanisms

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## Abstract

Software Defined Networking (SDN) has become increasingly popular as a networking paradigm due to its advantages over traditional networks, such as scalability, flexibility, and programmability. However, SDN networks face security threats, particularly from Distributed Denial of Service (DDoS) attacks. These attacks aim to overwhelm a target server or network by flooding it with illegitimate traffic, rendering it inaccessible to legitimate users. Currently, most DDoS attack detection methods rely on supervised learning models. In this study, we propose an alternative approach using unsupervised learning, specifically combining fusion entropy and computational puzzles. Our proposed method involves three steps. Firstly, access control lists are implemented for IP filtering to reduce the attack load on the controller. Secondly, we utilize the fusion entropy method to detect DDoS attacks and identify potentially suspicious hosts. Lastly, we employ a Proof of Work based computational puzzle on these suspicious hosts to detect and mitigate the attacks. The proposed work is implemented in Mininet emulator with POX as controller. The results demonstrate that this mitigation technique enhances accuracy by reducing the occurrence of false positives.

**Keywords:** SDN, DDoS, ACL, Fusion Entropy, Mininet, PoW.

# Transformer based Speech to Text Translation for Indic Languages

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## Abstract

In this study, we are looking into additional ways that could help us enhance our output from Speech recognition models. We're specifically interested in improving the language model (LM) to improve the current accuracy. Rare words continue to be a challenge in developing high-quality speech recognition systems because words based on names, proper nouns, or localities, often called tail words are crucial to the decoded transcript's meaning. They are difficult to handle correctly since they do not appear frequently in the audio text pairs that make up the training set. Using the transformer architecture, utilizing better datasets and fine tuning can help us achieve a more sustainable model.

**Keywords:** Natural Language Processing, Transformers, Mel Spectrograms, Activation Function, Langauge Model.

# A Minimalistic Model for Converting Basic Cars into Semi-Autonomous Vehicles Using AI and Image Processing

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## Abstract

Autonomous vehicles are vehicles that can operate without human intervention, and can go anywhere a traditional vehicle can go and perform any task that a skilled human driver can. These vehicles can address environmental and safety concerns by reducing crashes and decreasing reliance on fossil fuels. Human error accounts for 94% of road accidents, which can be significantly reduced by self-driving cars. In our project, we aim to convert any car with basic cruise control features into a semi-autonomous vehicle using image detection and processing, machine learning, and artificial intelligence. Our system will be a minimalistic model of the real-time product, where we aim to achieve functions such as lane switching, sign detection, object detection, and braking. By using this technology, we can create a safer and more sustainable driving experience for everyone.

**Keywords:** Autonomous vehicles, human intervention, YOLO, CNN, Autonomous vehicles, OCR, safety concerns, re- duce crashes, Road accidents, human error.

## UNI-KYC System on Blockchain

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## Abstract

The financial institution's Know Your Customer (KYC) procedure is its cornerstone. With the aid of this technique, the banking industries and other service providers may confirm client identification information between trustworthy parties. A system is developed which provides a unique NFT token as the proof of ownership to the customers who have completed their one-time KYC procedure with any of the institute within the network. The method also allows the exchange of KYC related data stored on IPFS. Financial institutes can authenticate any individual by either just verifying the NFT or by the data stored under that particular token via a dedicated gateway of Infura, which enable transparency and immutability. The decentralized KYC process simplifies the acquisition of secure and rapid access to current user data.

**Keywords:** KYC (Know your customer), NFT (non-fungible tokens).

# Prediction of Drought -A machine Learning Approach using Time Series Data

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## Abstract

In order to forecast drought in a certain area, this research employed three different machine learning models, namely ARIMA (Auto Regressive Integrated Moving Average Model), VAR (Vector Auto Regressive model), and Prophet. These models are used to forecast upcoming drought occurrences and are trained using historical data on a variety of meteorological factors, including temperature, precipitation, humidity, and wind speed. Different statistical metrics, such as mean absolute error, root mean squared error, and coefficient of determination, are used to assess each model's performance. The findings indicate that all three models are capable of accurately and reliably forecasting drought episodes, with Prophet surpassing the other models. According to findings of the study, machine learning models can be useful tools for forecasting drought episodes in a particular region, giving decision-makers a head start on taking the necessary actions to lessen the effects of drought on agriculture, water resources, and society. Among the three time series models experimented, Prophet model exhibited the accuracy of 92.01% which is the best when compared with the other two models. The choice of selecting a model for predicting the drought depends on the type of data being used for experimentation.

**Keywords:** Drought prediction, ARIMA, VAR, Prophet, Time0series model.

# Detection and Classification of Multiple Plant Diseases using CNN

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## Abstract

Plant diseases can have a significant influence on agricultural productivity, quality, and profitability. Early identification and precise diagnosis of plant diseases are essential for successful disease control, which may reduce the use of pesticides and minimize crop losses,. In this study, a machine learning-based approach is developed to identify the diseases of various plants using leaf images. Dataset of leaf images of 14 different crops are collected, including apple, pepper, potato, raspberry, blueberry, cherry, peach, soybean, squash, strawberry, corn, grape, orange, and tomato. The images are preprocessed using techniques such as normalization, resizing, and augmentation, to reduce noise and increase the diversity of the dataset. Convolution neural network (CNN) model is used as the back-end and Flask for the front-end to create a user-friendly web application. An interpretability analysis is conducted to understand the features learned by the model, which can provide insights into the underlying causes of the diseases. The study shows the potential of machine learning approaches for early diagnosis and identification of plant diseases, which can assist farmers in taking prompt action and minimizing crop losses. This approach can be extended to other crops and can be integrated with other technologies, such as drones and sensors, for remote and real-time monitoring of crop health.

**Keywords:** Convolution neural networks (CNNs), Deep learning, Automated plant disease diagnosis, Machine learning techniques, Large and diverse dataset, Leaf images.

# Transforming Judicial Systems with Blockchain: A Court Case Governance System for Tamper-Proof and Transparent Legal Processes

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## Abstract

A court case governance system is a decentralised judicial system that uses blockchain technology to create a tamper-proof, transparent, and secure form of record-keeping for legal processes. A distributed ledger powered by a network of computers is known as blockchain technology. Every transaction is digitally entered into the ledger, encrypted, and verified by the network of users. A court case governance system using blockchain technology can produce smart contracts, which are self-executing contracts with the contents of the agreement between the buyer and seller being directly placed into lines of code. Decentralising the process of automating contracts and arbitrating legal issues is possible with the help of these smart contracts. Users are given the power to draught and execute intelligent contracts, and disputes are resolved through decentralised arbitration. This strategy enables a method to incentivize jurors to evaluate cases fairly and accurately since judgements are upheld by smart contracts.

**Keywords:** Blockchain, Court Case, Governance System, Tamper-Proof and Transparent Legal Processes.

# Security and Safety System using Facial Characteristics

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## Abstract

Facial recognition is a popular technology used to identify an individual's identity based on their personal characteristics. This process involves two stages: face detection, which humans can do quickly, and face recognition, which recognizes an individual's face. This process has been studied and developed by experts and is commonly used in biometric technology. The Eigenface method and Fisherface method are two of the widely used methods in face recognition. The Eigenface method uses Principal Component Analysis (PCA) to reduce face dimensional space for facial features. The face space is created by finding the eigenvector that corresponds to the largest eigenvalue of the face image. A system is proposed that combines face recognition and sleep detection to improve driver safety. This system uses a camera mounted on the dashboard to capture the driver's face and analyze it for fatigue and drowsiness. Machine learning algorithms are used to identify the driver's face and alert them if they are detected to be falling asleep or getting tired. This real-time system is designed to be integrated into cars to prevent accidents caused by driver fatigue. The project aims to contribute to the development of advanced driver assistance systems (ADAS) to improve road safety.

**Keywords:** MTCNN, face detection, face recognition, PCA, Sleep detection, Haar Cascade, EAR.

## Detection of Bowler Errors using Deep Learning

**Paper ID**
**ICAISC 813**

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## Abstract

Cricket is a bat and ball sport played between two teams of eleven players each. There are two innings in a game for each team, and when one team takes the fielding, two players from the other team will get the chance to bat. There are 4 umpires for giving perfect decisions. Two umpires are on the ground and the third umpire looks all things via computerized cameras. T20, test, ODI's are the some of the different types in cricket matches. It is the most popular and widely played game in the world and hence the decisions must be accurate. In every cricket match there are many different scenarios to classify legal and illegal deliveries. No-Balls, wide ball, bounce etc. are the most common umpire decisions in every cricket match. The classification of these decisions plays an important role in a fair game. Earlier research on automated third umpired decision was done using text dataset with accuracy of 80%. We propose a model on automation of third umpire's decision using image dataset. In the existing system third umpire has to give the decisions using the technologies like Decision Review System, ultra-edge, hotspot. This will take more time to give decisions and needs an expert also to display the decisions. In such cases the whole process can be automated and can increase the transparency in decisions within less time. We will be using images that contains different required scenarios. Since there is no standard dataset available, we created our own dataset that includes 20 bounce, 24 no ball and 10 wide ball images. We will be using CNN and VGG16 algorithms and will make comparison between the accuracies obtained from them. This model can provide spontaneous decisions without the human intervention. The proposed model has an accuracy of 99.7% for CNN and 57.6% for VGG16.

**Keywords:** Deep Learning, No ball, Wide and Bounce ball, CNN, VGG16.

## Virtual Medical Assistant in English and Kannada Languages

**Paper ID**
**ICAISC 814**

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## Abstract

Health care and medicine are two crucial facets of human existence. This guarantees patients the right to accurate and timely clarification of any questions they may have about their health state. A virtual assistant makes it simpler for consumers to consult the medical personnel in the pandemic situation from the comfort of their homes without any direct contact. This work discusses various methods for building virtual medical assistants that may interact with people to answer simple questions about health characteristics and recommend necessary actions to the user. In order to identify the ailment, the system extracts essential terms from the chat and applies predictive analysis. The user is advised to see a doctor, take medication, or visit the hospital, depending on the severity of the symptoms. The real goal of this job is to address the user's symptoms and offer appropriate medical advice in order to shorten the process's time and expense requirements.

**Keywords:** Virtual Medical Assistant (VMA), pandemic, Chatbot, Voicebot, Natural Language Processing (NLP).

# Investigating the Impact of Visual Attention Models in Face Forgery Detection

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## Abstract

With the recent rise of realistic face manipulation methods, building robust face tampering detection methods has become more important than ever before. Visual attention has played an important role in highlighting discriminative regions within input which is important for making accurate predictions. This manuscript presents a comparative study of several recently proposed visual attention models for the problem of face forgery detection. Specifically, five visual attention models namely, coordinate, selective kernel, triplet, CoT, and shuffle attention have been tested by integrating with a baseline deep learning model. The modified visually attentive architectures are trained and tested on the popular public benchmark dataset FaceForensics++. The experimental results achieved by different attention approaches are compared. Additionally, the computational costs involved in each type of attention have also been discussed specifying the accuracy and computation tradeoff. Experimental results prove that Triplet Attention performs best by achieving accuracy scores of 0.9543 and 0.7190 on the DF and NT categories of the FF++ dataset. Triplet attention is also extremely lightweight with only 1200 trainable parameters compared to the other attention modules under study.

**Keywords:** Visual attention, Face forgery, Face tampering, deepfake, attention, detection.

# Extreme Gradient Boosting based Fetal Health Classification

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## Abstract

A fetus is an unborn child still in the embryonic phase and will be born after the embryo develops. Pregnancy lasts for three months during a trimester. Regular checkups are required since the fetus develops and grows during this time. We all know that a pregnancy lasts nine months, and many things can happen during that time that can cause the newborn to become disabled or even die, a hazardous situation that must be avoided. A CTG (cardiotocography) is a critical tool for assessing fetal health while still inside the mother. The doctor assesses the patient's health and gives his opinion based on uterine contractions and heartbeat. However, there is room for inaccuracy, making doctors' interpretation of the data untrustworthy. As a result, a variability of the machine and deep learning algorithms for data analysis and prediction of fetal health have been developed. The main goal of this research is to establish prediction accuracy using several classification models and to compare which model performs best.

**Keywords:** Comparative analysis, machine learning, cardiotocography, fetal health, XGboost.

# Smart Vehicle Parking system on Fog Computing for effective Resource Management

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## Abstract

The rapid advance in the number of vehicles on the road led to a corresponding growth in demand for parking spaces. However, conventional car parking systems are inefficient and time-consuming. Smart Parking systems also require immediate response, and low latency, which may be impacted by data transfer delays to and from the cloud. Cloud computing can provide infrastructure-level services. Also, the smart parking system is a sensitive application that can lead to disaster if an immediate decision has not been taken. To address these challenges, this research proposes the smart car parking system using fog computing that reduces latency. The suggested smart vehicle parking system uses a combination of sensors, cameras, and edge devices to collect and process parking-related data. This connection generates an enormous bundle of data that is required to be saved and processed. Fog computing widens cloud services to the end of the network to cut down latency and congestion. The major challenge in implementing Fog computing is managing the resources, which involves applications to determine each edge gadget effectively, which reduces latency and increases throughput. The proposed simulation that portrays IoT and Fog nodes and evaluates the consequences of resource management approaches in terms of QoS parameters. The proposed hybrid markov system have been utilized in various parking scenarios, including shopping centres airports, and residential areas. The paper contributes to the development of a smart vehicle parking system by proposing a computing-based approach using fog that optimizes resource utilization and provides real-time processing for parking management.

**Keywords:** Smart vehicle parking system, Fog Computing, Resource Management, Cloud Computing, Internet of Things (IoT).

# An Efficient WBC Cancer Cells Prediction Using Dense Net Algorithm

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## Abstract

The critical factor causing cancer disease is aberrant cells that prevent normal blood cells from growing. There are many types of cancer diseases. This study proposes automating the diagnosis of this condition. This study suggests the use of tiny blood pictures. There were 62 preparations and 38 tests. Segmentation and clustering were performed using YCbCr, Gaussian Distribution, Otsu Adaptive, and K-Means. Convolutional Neural Networks were used to classify GLCM features. This splits these disorders into two groups based on similar symptoms, making diagnosis challenging. The doctor had a choice between two possibilities. Each technique calculates the characteristics of one of the two sickness groups. The Random Forest classifier was used to conclude. The proposed method intends to increase system learning, reduce misdiagnosis, and detect white blood cell malignancy early. This study suggests using tiny white blood cell pictures to detect leukemia in patients. The cell shape classifier was investigated using MATLAB and LabVIEW in this study. The proposed method intends to increase system learning, reduce misdiagnosis, and detect white blood cell malignancy early. This study suggests using tiny white blood cell pictures to detect leukemia in patients. This research's primary application is using machine learning prediction systems in hospitals.

**Keywords:** YCbCr, GLCM, Dense Net Algorithm, White blood cells.

# CNN-Powered Monument Detection Webapp for preserving India's Cultural Heritage

| | | |
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## Abstract

Particularly in India, where a wide variety of monuments and historical sites are dispersed throughout the nation, cultural heritage protection has recently gained importance. This study introduces a web application for monument discovery powered by Convolutional Neural Networks (CNN) that provides a variety of elements that will aid in protecting India's cultural heritage. CNNs are used by the app as the deep learning technology to precisely recognize and classify monuments based on photographs that user's input. The web app's user-friendly layout makes it accessible to those with little to no technological knowledge. It also provides a number of helpful features, such as local weather predictions and temperature information for users at the monument site. Additionally, the app has an interactive map that shows the monument's precise location and address. When visiting historical places, these aspects help to provide guests a more thorough and immersive experience. The outcomes demonstrate how effective the CNN-based web application is at classifying monuments. A sizable collection of images of famous sites in India were used to test the proposed method. The system may be used for cultural preservation, tourism, and education. Overall, this study provides a novel approach for locating monuments and significantly contributes to preserving India's rich cultural history. The accuracy of the proposed model is 92.14% in predicting monuments.

**Keywords:** CNN, Deep Learning, Artificial Intelligence, Soft Computing.

# Prediction of Possible Outcomes using Big Data Analysis and Machine Learning

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## Abstract

Big data analytics and Machine Learning (ML) are rapidly changing the way patient health is being tracked. Since Data is generated by every individual in this world anything or everything generates data and if this data is in the right hands, then it could help the employer do wonders, data is the most powerful weapon that is underestimated but data can change the face of the world. Big Data Analytics is used and is helping Healthcare evolve. By identifying these issues, we can keep potential health issues and provide solutions before the situation worsens. ML and Big Data technologies have a promising impact on healthcare industries. Big data analytics is also used to discover new treatments and medicines. This paper's main focus is to explore and analyze recent research about machine learning and big data analytics which will help identify certain diseases in their earliest possible stage or even before that, thereby providing better health services. Furthermore, the discussion on the limitations and future scopes in healthcare with machine learning and big data analysis helps to improve the way of solving the problems in this section.

**Keywords:** Big data, Machine learning, algorithms, data analytics, healthcare, disease prediction, data mining.

## Paper ID ICAISC 849

# Sentimental Analysis of Lockdown in India During Covid-19

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## Abstract

Sentiment analysis has quickly become one of the most prominent fields of natural language processing due to the spectacular increase in Internet usage (NLP). For a variety of situations, sentiment analysis can successfully extract the text's inferred emotion. During the COVID-19 epidemic, a tremendous amount of information is being received and shared on social media. Mining such content to assess people's attitudes may substantially improve decision-making in order to maintain control of the situation. In this study, sentiment analysis of tweets has been completed using NLP and machine learning classifiers. The data have been scraped from Twitter, annotated with Text Blob, and pre-processed using the natural language processing tools provided into Python. The study focuses on the sentiment analysis of people during COVID-19 pandemic in India. RNN is used for obtaining a tolerable level of emotion prediction. The proposed method categorised emotions into three categories such as positive, neutral and negative, and obtained an accuracy rate of 90% with a prediction that people support the government's decision to impose the lockdown during the spread of COVID-19.

**Keywords:** Supervised Learning, Sentiment Analysis, Natural Language Processing, Neural Networks, RNN, COVID-19.

## Paper ID ICAISC 851

# A New Wave in CyberSecurity: Democratising the Future Networking Landscape

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## Abstract

Internet use has grown ubiquitous worldwide. Online crime has grown alongside Internet activity. Cybersecurity has evolved rapidly to keep up with cyberspace's rapid changes. Cyber security refers to a nation's or company's online protections. The term "cyber security" was barely known by the general public two decades ago. Cybersecurity is an issue that impacts not just individuals but also businesses and governments. Everything is now digital, and cybernetics makes use of tools from the cloud, mobile devices, and the Internet of Things. The issues of confidentiality, safety, and restitution all arise when discussing cyber attacks. To protect networks, computers, programmes, and data from being attacked, damaged, or accessed without permission, cyber security has been developed. With an eye on the future of next-generation networks, this article provides a high-level review of several ANN and DL techniques utilized for Cybersecurity and CyberSecurity Capacity Building (CCB) strategies.

**Keywords:** Cybersecurity, Cybersecurity Capacity Building, Machine Learning, Deep Reinforcement Learning (DRL).

| Paper ID<br>ICAISC 858 | **An Empirical Analysis of PoS Tagging for Kannada Machine Translation** |
|---|---|

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## Abstract

Parts of Speech (POS) tagging process has emerged as one of the crucial and very basic preprocessing technique for any natural language processing tasks. In Kannada, a dominant language in southern India, morphologically rich and low resourced at the same time, PoS tagging process was difficult to achieve in the beginning. Later, studies show that Conditional Random Fields, Hidden Morkov Model and deep learning techniques have produced good accuracy. This paper investigates all the three above mentioned models and argues that deep learning model, which uses bidirectional Long Short Term Memory as a RNN unit , produces the highest accuracy of 93% in contrast to CRF and HMM model with a precision accuracy of 65% and 42% respectively. Also, the paper specifies how important a PoS tagging process is in the task of Machine Translation, which is booming in the world of computational linguistics.

**Keywords:** Conditional Random Fields (CRF), Word2Vec, Hidden Morkov Model (HMM), bidirectional Long Short Term Memory (BiLSTM).

| Paper ID<br>ICAISC 865 | **Plant Leaf Disease Classification Using Modified SVM With Post Processing Techniques** |
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## Abstract

In order to prevent yield loss and quality of the agricultural product, early detection of diseases in plant is essential. Using visually apparent patterns on the plant, numerous studies on plant illnesses have been extensively investigated to discover abnormalities in plant growth. A sustainable agriculture depends on plant monitoring and disease detection. However, because they demand precise and real-time diagnosis, monitoring plant diseases manually is highly challenging. Plant disease diagnosis frequently uses image processing, which includes picture acquisition, pre-processing, segmentation, feature extraction, and classification. In this paper, an efficient plant disease classification using SVM Classifier is proposed. Firstly, the adaptive histogram technique is applied to the image and the required part is segmented using Otsu's segmentation. The segmented output is applied to SVM to classify between the normal and diseased images. Further, the soft thresholding is applied to improve the accuracy. The proposed method is tested for standard database to obtain 95% accuracy compared to existing techniques.

**Keywords:** Plant Disease classification, Artificial Intelligence, Support Vector Machine (SVM), Image processing algorithm, Soft thresholding, Cucumber Mosaic.

# EEG Classification Using Modified KNN Algorithm

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## Abstract

Automatic classification of EEG signals is required for the early identification of various disorders. In this research paper, statistical denoising and a modified KNN algorithm are coupled to create a smart method for classifying the EEG signal in order to accurately detect disorders. The EEG data are denoised statistically to produce a clearer signal, and the modified KNN algorithm is then used to classify the appropriate disease features with the aid of a classification block. The suggested algorithm's detection accuracy is compared to the detection accuracy of other existing algorithms, demonstrating the algorithm's effectiveness.

**Keywords:** EEG signal processing, Haar wavelet transform, KNN Algorithm.

# A Smart Contract for Coffee Supply Chain

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## Abstract

Coffee is a highly popular and widely traded beverage across the globe. Its consumption is steadily increasing at an annual rate above 2%, as per the 'Coffee development report 2019' by ICO. It has been observed that the coffee market has grown significantly by over 60% since the year 1990. In India, there are around 250,000 coffee growers, out of which 98% are small growers with farms of 10 acres or fewer. Due to limited access to official financial support, middlemen play a crucial role in providing credit, technical support, and trading services to smallholder coffee growers. However, there are risks associated with adulteration, poor storage, and transportation facilities. Moreover, climate changes have also adversely affected coffee production. Conventionally, coffee trade is conducted through middlemen via phone calls and paper documentation, which leaves room for potential fraud and data manipulation. The objective is to resolve these challenges and ensure full transparency in trading through the utilization of advanced technologies. We suggest employing a smart contract for the coffee supply chain by incorporating Blockchain and IoT devices. Blockchain is a tamper-proof digital ledger distributed across the network, containing immutable digital records. This will guarantee complete transparency of data and avoid any manipulation. Throughout this project, we gained expertise in various aspects of the supply chain and acquired technical knowledge of IoT devices and Blockchain. We designed a proposal that could be utilized for industrial purposes and promote societal development. Additionally, this smart contract can be utilized for other products besides coffee, thereby enhancing the complete supply chain of different agri-products throughout the nation.

**Keywords:** Coffee, Supply chain, smart contract, Blockchain, IOT.

| | | |
|---|---|---|
| **Paper ID**<br>**ICAISC 874** | **Development of Machine Learning Model for Assistance of Visually Impaired** | |

# Development of Machine Learning Model for Assistance of Visually Impaired

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## Abstract

People with reduced vision or total blindness frequently have trouble navigating new environments on their own. It can be difficult to travel or even just stroll down a busy street. As a result, many people with poor eyesight frequently travel with a sighted friend or relative. It is harder for them to recall where they usually are. The goal of this initiative is to completely liberate the blind individual. The project is a virtual eye that communicates with the outside environment using a camera. The system continuously gets data from the camera. The information is gathered using cameras that are meant to be in the Centre of the eyes. Input signals were processed using APIs and algorithms, followed by speech processing units are utilized to communicate with the blind individual. By employing the audio output to communicate the processed information about their environment, blind people can move and finish their task easily on their own. The accuracy of the suggested method is 98%, 95%, and 90%, respectively, for object detection, face recognition, and Optical Character Recognition (OCR) methodology. The recognized object, text and face are then processed to obtain audio instructions.

**Keywords:** Machine learning, Tensor-Flow API, SSD Detection, COCO Datasets, Haar Cascade Algorithm, Visually Impaired Assistance.

| | | |
|---|---|---|
| **Paper ID**<br>**ICAISC 930** | **Fault Prediction Method and System of Acquisition Terminal based on Bayesian Network Optimization Algorithm** | |

# Fault Prediction Method and System of Acquisition Terminal based on Bayesian Network Optimization Algorithm

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## Abstract

The acquisition terminal fault prediction method and system based on Bayesian network optimization algorithm is a powerful tool, which can be used to predict faults in complex systems. This method is based on the principle of Bayesian network optimization, including the use of probability models to predict future events. The system works by analyzing data from various sources, including sensors, logs, and other monitoring devices. Then, it uses this data to establish a probability model of the system, which can be used to predict future faults. One of the main advantages of this method is its ability to handle large amounts of data. By using advanced algorithms and machine learning techniques, the system can quickly analyze a large amount of information and identify patterns that may indicate potential faults. In general, the acquisition terminal fault prediction method and system based on Bayesian network optimization algorithm represent an important progress in fault prediction technology. By providing accurate and reliable predictions of potential faults in complex systems, it is possible to save time, money, and even life. In this paper, we describe a fault prediction method and system using Bayesian network optimization algorithm. The purpose of the research work is to identify the optimal set of variables that contribute to high-precision fault prediction, while reducing training time without affecting prediction ability.

**Keywords:** Bayesian network optimization algorithm; Fault prediction of acquisition terminal.

# Intelligent Control of Automated Microelectronic Production Lines Based on Artificial Intelligence

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## Abstract

Artificial intelligence is currently the most popular technology. With the advent of the era of big data, information technology based on artificial intelligence has become a new type of technology capable of most of the human labor force. Its scope of application is mainly in the comprehensive processing of improving efficiency, and those companies that need to improve efficiency do need corresponding technical support. Through artificial intelligence technology, the production line can analyze and predict the production process, so as to optimize and upgrade the production process. At the same time, intelligent production lines can also realize real-time monitoring and analysis of production data through big data analysis technology, thereby improving the reliability and stability of the production process. Automated control and optimization adjustments can also be realized in the production process. Through the intelligent control system, the production line can automatically complete the processing, assembly, testing and other work of the product, and the production process and process parameters can be automatically adjusted according to the production situation, so as to realize the autonomy and intelligence of the production process. This article first introduces the basic framework of artificial intelligence in detail, then applies artificial intelligence to the research of intelligent control of automated microelectronics production lines, conducts data tests on the overall efficiency, and finally uses questionnaires on the production personnel of the waterline and the overall efficiency of the company. It can be shown that artificial intelligence is of great help to improve the efficiency of production lines. Therefore, making good use of artificial intelligence is a very worthy topic for the research of intelligent control of automated microelectronics production lines.

**Keywords: a**rtificial intelligence, automation, electronic production line, intelligent control.

# Intelligent Financial Decision Support System Based on Artificial Intelligence

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## Abstract

In view of the financial risks existing in the development of enterprises, the traditional financial management system is difficult to achieve the risk tracking and prediction. In the research, applied artificial intelligence technology, an artificial neural network model based was proposed to achieve the prediction of enterprise financial risk indicators, so as to provide the decision support for enterprise production and operation. Through the neural network model, the simulation of biological neural network processing information process prediction was carried out, non-quantitative variables were processed. When the number of hidden layers was 11 layers, the comprehensive judgment accuracy of type was 91.67%. From the above training and simulation procedures, when the hidden layer is 11, the model established in this study has a high prediction effect, with a prediction accuracy of 91.67%. Through experiments, result finding that the model has high financial prediction ability, reaching over 90%, this provides a reference for financial intelligent decision-making in enterprises. Although there are many academic researches on financial early warning, the research on traditional energy enterprises is not perfect. It is hoped that the research results of the research can provide some reference for the financial early warning of enterprises.

**Keywords:** financial risk, decision support, stochastic algorithm, the neural network.

<table>
<tr><td></td><td>## A Blockchain-enabled Authentication Scheme for IoT Cybersecurity Infrastructure</td></tr>
</table>

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## Abstract

Cyberattacks, particularly those that take place in real time, will be able to target an increasing number of networked systems as more and more items connect to the Internet of items. While the system is operational, it is susceptible to intrusions that might have catastrophic consequences, such as the theft of sensitive information, the violation of personal privacy, or perhaps physical injury or even death. These outcomes are all possible while the system is operational. A mixed-methods research approach was required in order to fulfill the requirements for understanding the nature and scope of real-time assaults on IoT-powered cybersecurity infrastructure. The quantitative data that was utilized in this research came from an online survey of IoT security professionals as well as an analysis of publicly available information on IoT security incidents. For the purpose of gathering qualitative data, in-depth interviews with industry experts and specialists in the area of Internet of Things security were conducted. The authors provide a novel method for identifying cybersecurity flaws and breaches in cyber-physical systems, one that makes use of deep learning in conjunction with blockchain technology. This method has the potential to be quite useful. Their proposed technique compares and evaluates unsupervised and deep learning-based discriminative methods, in addition to introducing a generative adversarial network, in order to determine whether cyber threats are present in IICs networks that are powered by IoT. The results indicate an improvement in performance in terms of accuracy, reliability, and efficiency in recognizing all types of attacks. The dropout value was found to be 0.2, and the epoch value was set at 25.

**Keywords:** Internet of Things, Smart Environment, Cybersecurity, Blockchain.

<table>
<tr><td></td><td>## Pending Interest Table Control Management with Optimal Forwarder Selection in Named Data Network</td></tr>
</table>

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## Abstract

As a result of its usefulness in a variety of contexts, Named Data Networking (NDN) has been a popular topic of study in the last several decades. The Pending Interest Table (PIT) is a crucial part of the NDN that keeps track of all the data included in interest packets. Even if there is no flexible replacement policy, controlling PIT remains a significant problem because of the widespread use of long-term interest. The proposed PIT control system combines the Adaptive Virtual PIT (AVPIT) system, the Smart Threshold Interest Lifetime (STIL) system, as well as the Highest Lifetime Least Request (HLLR) principle. Based on the Interest Satisfaction Ratio (ISR) and the available PIT table capacity, our work chooses the best forwarder to send the packet of interest. Our work uses this method to successfully handle PIT controls via NDN.

**Keywords:** NDN, Optimal Forwarder Selection, Interest Table Control Management and PIT.

# A Groundbreaking Hexagonal Network Design for Smooth LTE-Unlicensed and WLAN Coexistence

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## Abstract

Tremendous demand for mobile data at recent years is solved from new innovations of coexistence among network operators. Extending long term evolution (LTE) over unlicensed band (i.e., LTE-U) with the coexistence of Wireless Local Area Network (WLAN) which carries more complex interaction between two different technologies that leads degradation of throughput and data rates. Missing of coordination in LTE-U and WLAN causes higher levels of cochannel interference. To address this unfair coexistence problem, we propose a Hexagonal Network Design (HED) for achieving higher throughput during coexistence of LTE-U and WLAN in unlicensed band. 120° sectoring of cellular network minimizes co-channel interference and employment of spectrum agent in HED is likely to support accurate spectrum decisions. Validate Channel before Communication (VCC) and chose optimal user equipment using hybrid Particle Swarm Optimization with Fuzzy Logic (PSO-FL) algorithm. Clustering using REpresentatives (CURE) algorithm is involved to manage all the participating user equipment in HED. Evaluation result of this work is simulated from Ns-3, demonstrates that HED can improve throughput while providing coexistence between LTE-U and WLAN.

**Keywords:** LTE, Wireless LAN, Co-channel interference, Throughput.

# The Cluster-based Cognitive Radio Sensor Networks that are Wireless Aware of PUEA and SSDF Attacks

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## Abstract

This paper presents a secure Cognitive Radio– Wireless Sensor Network (CR-WSN) architecture. CR-WSN is a cluster based network in which the sensors are hierarchically structured. Each cluster is chosen with single cluster head that operates on ISM band frequencies. Sensor data from cluster members are aggregated by cluster head. Cluster heads forwards the collected data to sink based on selection of a shortest path using Dijkstra algorithm. Due to the problem of spectrum scarcity, Cognitive Radios are subjected to two main attacks for utilizing the unlicensed spectrum. We resolve Spectrum Sensing Data Falsification attack and Primary User Emulation attack. Dynamic Spectrum Sensing Technique is involved for performing spectrum sensing. We propose a regression based spectrum sensing data falsification attack detection technique and mathematical SHA with Digital Signature is applied for primary user emulation attack detection. Extensive implementation is handled in Network Simulator 3 and comparative results are illustrated for betterment of throughput and end-to-end delay efficiencies.

**Keywords:** CR-WSN, clustering, attacks, spectrum sensing, routing.

# Research and Design of Business English MLP Based on DM Method

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## Abstract

The demand for international business skills has increased as a result of the swift expansion of economic globalization. The need for experts in business English has increased as the area enters a phase of rapid development. Growth. With the rapid development of Internet technology, mobile online learning methods are loved by the majority of people. Artificial intelligence(AI), the Internet of Things, cloud computing, and other technologies have advanced quickly in recent years with the emergence of the big data era. This paper conducts research on the business English MLP based on Data mining(DM) methods, and proposes to use the Apriori correlation algorithm to conduct research on the MLP. According to the characteristics of the Mobile learning platform(MLP), the basic framework of the business English MLP is designed, combined with DM methods. In order to calculate its operating efficiency, part of the data records from students of a certain university on the Business English mobile platform are extracted and combined with the Apriori algorithm. The data shows that the overall execution time of the transaction which Apriori processes is faster while the response time for different transaction volumes is the same under different transaction data volumes. Within 30s, as the amount of data in the number of transactions increases, the time required for the algorithm continues to increase. It can be seen that its algorithm is more efficient and improves the performance and operating efficiency of the business English learning platform.

**Keywords:** Business English, Mobile learning, DM, Internet technology, Apriori algorithm.

# The Coexistence of LTE-U and WLAN: Absolute Channel Allocation for Device-to-Device Communication (AD2D)

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## Abstract

Device -to- Device (D2D) communication is a recent technology enabled to perform direct communication between devices. The significance of D2D are minimized power consumption, delay and enhanced spectral efficiency and data rates. The use of unlicensed spectrum is extended towards Long Term Evolution (LTE), while creating coexistence with Wireless Local Area Network (WLAN) that is supported for D2D communication. The challenges on utilization of spectrum and also to solve the spectrum scarcity problem, unlicensed bands are made use of LTE. This paper addresses the channel allocation for D2D communication in coexistence of LTE and WLAN over unlicensed band. Both Real Time (RT) and NonReal Time (NRT) packets are taken in account, two different data packets are allocated with a single channel for two D2D pairs and improve spectrum efficiency. A special sensing entity called Spectrum Agent is deployed to make final decisions on idle sub-frames based on rules and also rank the idle sub-frames using Analytical Hierarchical Process. To enhance the decision making, rules are applied over neural network. Type-2 fuzzy model to identify the users with higher probability followed security validation. This work is implemented in Network Simulator 3 and results show better performances in terms of throughput, spectral efficiency, average delay, secrecy throughput and secrecy rate.

**Keywords:** D2D communication, Real time packets, Non-real time packets, channel allocation, WLAN, unlicensed bands.

**Paper ID
ICAISC 1235**

# An Automatic Monitoring System for Sports Training Indicators Based on Deep Learning and Multiple Sensors

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## Abstract

In recent years, with the rapid development of computer and network technology, people have become increasingly concerned about health. In order to ensure health and human health, more and more people have begun to pay attention to physical exercise. However, currently many fitness monitoring systems only collect and collect exercise data, without real-time monitoring of exercise. Moreover, traditional methods for monitoring sports training indicators lack real-time performance, and the accuracy of sports testing is also not high. This article first explores deep learning, then explains some of the changes it has brought to the field of automatic monitoring system design, and then explores the important achievements and breakthroughs that can be achieved by combining deep learning algorithms in the setting of automatic monitoring systems. Using the data survey method to investigate and statistically analyze the deep learning algorithms used in the design of automatic monitoring systems, it can be seen from the survey results that the automatic detection system using deep learning algorithms has better efficiency and accuracy than the old system. Therefore, the design of deep learning algorithms and multi-sensor sports training index automatic monitoring systems plays a crucial role.

**Keywords:** deep learning algorithm, multi-sensor collaboration, automatic indicator monitoring system, sports training.

**Paper ID
ICAISC 1280**

# Routing Algorithm Based on High Latency Communication Node Awareness in Dynamic Networks

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## Abstract

Aiming at the instability of communication links caused by environmental interference, dynamic change of node location, and long distance between nodes in the dynamic networking process of mobile clusters, this paper proposes an algorithm for high delay communication node perception and routing in dynamic networking, predicts the nodes that may generate high communication delay, and optimizes the path selection between high delay nodes to prevent network congestion. First of all, according to the communication status in the time series, the BiLSTM algorithm is used to predict the attenuation trend of the signal with the increase of distance, and calculate the distance between nodes that can establish efficient communication; Then, based on elbow method and K-means algorithm, group is divided according to the distance that can establish efficient communication, critical nodes are identified, and cost capacity diagram is constructed for critical nodes; Finally, according to the network flow optimization algorithm with maximum cost and maximum flow constraint, the best matching link is calculated and mapped to the communication path between critical nodes. By planning the path selection strategy between nodes with high latency communication in the cluster, the problem of unstable communication in the cluster is solved with less system overhead and faster convergence speed.

**Keywords:** mobile topology network, trunk forwarding, signal prediction, network flow optimization.

| Paper ID ICAISC 1434 | **Research on the Method of Improving the Reliability of Distribution and Power Supply Based on Big Data** |
|---|---|

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## Abstract

This article studies the application of big data methods in distribution reliability prediction, proposes a distribution network reliability evaluation method based on big data, and conducts simulation verification. Firstly, the background and significance of research on distribution network reliability were introduced. Secondly, the application of big data technology in distribution reliability analysis was introduced, including modeling of distribution network reliability based on big data, analysis of load transfer after distribution network faults, optimization model of load transfer, and optimization analysis of distribution network power supply reliability. Finally, the application effect of the proposed method in improving distribution reliability was verified through examples.

**Keywords:** big data, power distribution and supply, genetic algorithm.

| Paper ID ICAISC 1452 | **A Study of Logistics Teaching Based on Multimodal Information Input** |
|---|---|

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## Abstract

With the development of information technology and the requirements of logistics English teaching reform, multimodality has become a hot topic of attention for language scholars and education experts in recent years. As a new educational concept, multimodality has been widely used in vocabulary and reading teaching, but by collating the related literature at home and abroad, it can be seen that there are fewer studies applied to the teaching of writing in logistics English, and most of the related studies at home and abroad are based on qualitative analysis. Therefore, this paper combines multimodal theory and writing teaching practice, and explores the influence of multimodal teaching on English writing teaching in logistics through classroom teaching experiments.

**Keywords:** multimodal teaching, input-output theory, logistics education model.

| Paper ID ICAISC 1499 | **Design of ID3 Decision Tree Algorithm in Network Data Public Management System** |
|---|---|

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## Abstract

Data mining in network data public management system refers to the process of automatically extracting useful information from large-scale network data by using certain methods and tools, so as to provide decision support for network managers[1]. Data mining mainly includes data preprocessing, classification, clustering analysis and so on. Decision tree is one of the most commonly used algorithms in data mining. ID3 decision tree is a decision tree classification algorithm based on information gain theory, which has been widely used in bioinformatics, economics, finance and statistics. Firstly, the information gain is used to calculate the contribution of the eigenvalues of the data set to the classification results. Then, the data set is sorted and segmented by information gain. Finally, the attribute value with the largest information gain is used as the classification result. The ID3 decision tree algorithm does not need to know the eigenvalue distribution of all attribute values in the data set in advance [2]. By classifying each record in the original data set, the probability distribution of the eigenvalue distribution of large samples can be inferred from a small sample. The ID3 decision tree algorithm is simple and the amount of calculation is small, but it is easily affected by the data missing in the data preprocessing process, so the ID3 algorithm cannot be directly applied to the data mining system. Aiming at the shortcomings of ID3 decision tree algorithm, this paper proposes an improved ID3 decision tree algorithm, and applies the algorithm to the network data public management system to realize the efficient storage and retrieval of network data.

**Keywords:** ID3 Decision Tree Algorithm, Network Data Management, Public Management System, C4.5 Decision Tree Algorithm, Network Data.

# The Secure Device-to-Device Communication (SD2D): Safely Sharing Unlicensed Bands between WLAN and LTE

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## Abstract

Recent developing technologies created the use of Long Term Evolution (LTE) over Unlicensed band (LTE-U). The utilization of unlicensed band for effective Device-to-Device communication is performed by coexistence of LTE-U with Wireless Local Area Network (WLAN). The challenges and limitations of this new technology are addressed. The major issues addressed in this paper are identification of idle sub-frame and security requirements. This paper presents a novel Device-to-Device Communication in coexistence of LTE-U with WLAN. Markov Chain model is proposed for the prediction of idle subframe and cross validate with the reports obtained from spectrum agent. Spectrum agent is a special entity that participates for accurate determining of idle sub-frames. We propose auction based channel occupancy for D2D communication. Bidding value is estimated based on collision probability and interference. Evaluation of bidding values in terms of Signal Interference Noise Ratio (SINR) and spectral efficiency by using novel Firefly based Particle Swarm Optimization algorithm in each device. On allocation of idle sub-frames, D2D communication is involved by the usage of hybrid Elliptic Curve Cryptography with RSA algorithm. Finally experimental evaluation is performed in Ns-3 simulator and results are evaluated in terms of average throughput, delay, dropping rate and system secrecy rate.

**Keywords:** LTE-U, WLAN, Auction, D2D communication, Cryptography.

# A k-Means Clustering Algorithm for Data Analysis of Wearable Equipment of Construction Personnel

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## Abstract

Wearable device data analysis is the key to construction personnel management. In the process of wearable device data analysis, signal interruption is easy to occur, which reduces the accuracy of analysis, and causes key data loss and abnormal signal interference. This paper proposes a k-means clustering method to analyze the similarity of wearable device data, enhance the transmitted signals and shorten the interval between adjacent signals. Then, the signal attenuation and frequency are analyzed iteratively. Finally, the wearable device signals are searched by clustering theory, and the final analysis results are output. MATLAB shows that k-means clustering method can analyze data accurately, the data loss rate is less than 10%, and the analysis accuracy rate is more than 80%, which is better than single clustering analysis method. Moreover, in the k-means clustering method, the data analysis time of wearable devices is shorter, the location analysis time is 1/2, 1/4, and 1/6, and the abnormal signal recognition time in individual devices, group devices, and all devices are better than the single clustering method. Therefore, k-means clustering method can meet the data analysis requirements, and is suitable for construction personnel management.

**Keywords:** wearable device, data analysis, k-means clustering algorithm, high resolution, wavelet chaos.

<table>
<tr><td>Paper ID<br>ICAISC 2123</td><td>

# Health State Estimation of Electric Vehicle Power Battery Based on K-means Algorithm

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</table>

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## Abstract

Power batteries are the core components of electric vehicles, and their health status is crucial for the safety, stability, efficiency, and economic development of electric vehicles. However, the complexity and nonlinear characteristics of batteries make it difficult to assess their health status. There are some issues with current battery management systems during use, such as the inability to accurately assess the health status of batteries and predict their lifespan. To address these issues, this study proposed a new method based on the K-means algorithm, which can collect and analyze parameters such as battery voltage and current, and then cluster the data using the K-means algorithm. In this way, people can better understand the status of the battery and predict its lifespan. This study also adopted a new data processing method. This method can divide the data into multiple different groups, making the similarity between the data more apparent, thereby improving the accuracy of the model. After experimental verification, the method can effectively evaluate the health status of batteries and effectively manage and control batteries on this basis. This is of great significance for the safety, stability, efficiency, and economic development of electric vehicles. It can improve the reliability and economy of electric vehicles, providing important support for the development and application of new energy technologies.

**Keywords:** electric vehicle, power battery pack, k-means algorithm, health state estimation.

<table>
<tr><td>Paper ID<br>ICAISC 2135</td><td>

# Quantified Trading Strategy based on LSTM

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| **Le Xu** | **Xiaolong He** | **Jianing Wang** |
|---|---|---|
| School of Business | School of Business | School of Business |
| Dalian University of Technology | Dalian University of Technology | Dalian University of Technology |
| Dalian, Liaoning, China | Dalian, Liaoning, China | Dalian, Liaoning, China |

## Abstract

In order to meet the goal of maximizing traders' profits, we established a hierarchical position management model based on neural network prediction and formulated the optimal trading strategy. The model uses neural network and multi-cycle comprehensive prediction to quantify investment from the data perspective, reduces prediction risk, and provides the upward trend for the next trading day. In addition, we established a model of batch opening and reducing positions, where the amount of buying and selling follows an exponential distribution, which can minimize the holding cost of heavy stocks and increase profits. The results show that our quantitative trading model is effective.

**Keywords:** LSTM neural network, Quantitative trading, Multi-cycle comprehensive forecast.

<table>
<tr><td>Paper ID<br>ICAISC 2217</td><td>

# Application of Artificial Neural Network Technology in Electricity Marketing

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| **Yongjiao Yang** | **Chaolin Zeng** | **Chennan Zhou** |
|---|---|---|
| Guangdong Electric Power | Guangdong Electric Power | Guangdong Electric Power |
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## Abstract

Marketing is the main content of the development of electric power enterprises, but material costs and policy changes will affect marketing strategies and reduce marketing accuracy. Based on this, this paper proposes an artificial neural network technology to analyze marketing strategies, improve marketing level, and shorten the time of marketing strategy formulation. The performance data is then fully evaluated. Finally, the survey analysis is used to conduct power marketing and output the best marketing strategy. The research strategy shows that artificial neural network technology can accurately formulate marketing plans, improve marketing level, and the sustainability is greater than 80%, the application effect of artificial neural network technology in power marketing is better, which is suitable for the comprehensive analysis of power marketing.

**Keywords:** electricity, marketing, data, artificial neural networks, algorithm.

**Paper ID
ICAISC 2414**

# Design of Sports Equipment and Facilities Maintenance and Management System Based on PSO-SVM and DIALux

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## Abstract

With the continuous progress and development of science and technology, people are paying more and more attention to sports. In modern society, sports are a very important component. Sports equipment and facilities are often referred to as hardware resources or software resources, and can also be understood as a technical means or tool. It consists of hardware products such as sports venues and fitness equipment, as well as software environment elements such as computer network systems, forming a physical system. This article mainly focuses on the research of a sports equipment and facility maintenance and management system developed based on PSO-SVM (Particle Swarm Optimization Support Vector Machine) and Dialux language platform. The system is mainly composed of hardware layer and network components, utilizing servers, embedded operating systems, and data mining technology to manage these resources. Through the development of a framework, equipment maintenance and monitoring work is achieved, and relevant information is stored using a MySQL database. Afterwards, this article conducted functional testing on the system module, and the test results showed that the system's availability could reach up to 83%.

**Keywords:** PSO-SVM, DIALux, sports equipment, facility maintenance.

**Paper ID
ICAISC 2492**

# Research on Multimodal Futures Price Prediction Method based on DCC-GARCH Model

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## Abstract

As the economy and technology rapidly advance, financial investment has increasingly become a means for the general public to generate and accumulate wealth. Futures trading, a method in which buyers and sellers enter a standardized contract to exchange a commodity at a predetermined date, is one such avenue. While futures investments require minimal capital and permit investors to sell prior to buying, they also subject traders to greater investment risks. In recent years, as computer science and its interdisciplinary fields have developed, employing mathematical and statistical approaches to analyze and predict the futures market for wise investments has gained popularity. Considering the uncertainty and multimodal characteristics of the futures trading market, this study categorizes futures trading into five modes and investigates the relationship between these modes and futures prices. By utilizing the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model for predictions in varying mode environments, this research applies a mode correction function to adjust the base step in GARCH forecasts to address market fluctuations. Analyzing results derived from actual futures trading data reveals that the multimodal futures price prediction model demonstrates higher accuracy compared to the conventional GARCH model.

**Keywords:** futures trading, price prediction, multimodal, GARCH model.

# Health-Care Monitoring of Patient using CNN based Model in Internet of Things

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## Abstract

There is rising public concern about exposure to radiofrequency (RF) electromagnetic fields (EMF) as more and more wireless communications become concentrated in everyday living surroundings. There are a number of obstacles, primarily originating from infrastructure expenses, but recent technology breakthroughs are shifting attention to Internet of Things (IoT) devices that enable automatic and continuous realtime EMF monitoring. The Internet of Things (IoT) has made the world a better place by expanding the capabilities of telemedicine and allowing for more precise remote monitoring of patients. Improved healthcare facilities for both patients and doctors/hospitals are only one way that IoT is making a significant impact in the medical field. Five main parts make up the proposed system: patient data gathering, primary report creation, hospital care, pharmacy care, and diagnostics. This study presents an Internet of Things (IoT)-based healthcare scheme accomplished of real-time nursing of energetic signs and environmental factors for discrete patients. Five sensors, including a heart-rate monitor, a body temperature monitor, a room temperature monitor, a carbon monoxide monitor, and a carbon dioxide monitor, are utilised to collect data from the hospital setting. Medical personnel receive patient updates through a portal and use this data for further diagnosis and care. The success of the system demonstrates that the built prototype is ideal for healthcare monitoring. This study has investigated unique approaches to the automatic construction of convolutional neural network (CNN) topologies, and it has also developed a new method for diagnosis. The results of the trials prove that the recommended algorithm achieves improved than the state-of-the-art techniques.

**Keywords:** Convolutional neural networks, Hospital patient care, Monitoring, Disease Detection.

# Application of Chaotic Particle Swarm Optimization Algorithm in Remote Fault Detection of Electrical System

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## Abstract

With the development of social economy, the industrial field has entered the era of automation control. Due to the complexity and uncertainty in the industrial environment, electrical system failures are becoming increasingly frequent. In this paper, a common fault and the application of remote PLC detection combined with chaotic particle swarm optimization algorithm formula in electrical system fault can show the problems and solutions. However, the realization of remote PLC detection shows that necessary condition monitoring and fault diagnosis are carried out to ensure the life safety of staff and the reliable, normal and university operation of equipment. Finally, this article mainly analyzes the three types of data detected by remote PLC for electrical system faults.

**Keywords:** electrical system failure, common faults, chaotic particle swarm optimization algorithm, remote PLC detection.

# Detection and Classification of Brain Tumors using Magnetic Resonance Imaging and Artificial Neural Networks: A Novel Approach

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## Abstract

This research introduces a unique method for identifying and categorizing brain tumours using MRI scans. There are two primary phases to the method suggested. In the first step, the MRI scans are analysed to look for signs of a brain tumor by extracting characteristics from the pictures and separating the tumor from the surrounding healthy tissue. The collected characteristics are then fed into an artificial neural network (ANN) for tumor classification. Several actions make up the initial phase of the suggested method. First, the MRI scans are preprocessed to increase the contrast between the tumor and healthy tissues, and then the tumor is segmented from the rest of the picture. At this point, you may use any number of segmentation strategies, including thresholding, region growth, and active contour models. After the tumor has been segmented, key properties such as texture, shape, and intensity are retrieved. In the second phase, the ANN receives these characteristics as input. Second, the retrieved characteristics are used to train the ANN to identify the tumor type. The artificial neural network (ANN) is a kind of machine learning algorithm that takes cues from how the human brain works. It's built from several stacked nodes, each of which performs a different mathematical operation on the data being fed into it. The tumor's anticipated class is represented by the ANN's output from its deepest layer. The suggested technique offers significant benefits over the status quo when it comes to detecting and classifying brain tumors. Being totally automated, it removes human error and the inherent unpredictability in MRI picture analysis. It can also identify and categorise brain tumors, which is essential for helping doctors provide patients the best possible care. In sum, the suggested method has the potential to enhance the precision and efficacy with which brain tumors are diagnosed and treated.

**Keywords:** Accuracy, artificial neural network, automated, brain tumor, diagnosis, efficiency, feature extraction, machine learning, magnetic resonance imaging, segmentation, treatment.

# Prediction Method of Fluid Production Capacity based on Reservoir Engineering Theory and Data Mining Algorithm

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## Abstract

At present, there are some problems in the management and analysis of reservoir development data in domestic oilfields. Due to the lack of efficient integrated database model standard and application system for oil and gas reservoir evaluation, professionals mainly rely on manual data sorting and data conversion in comprehensive analysis, which wastes a lot of time. Fluid productivity prediction method based on reservoir engineering theory and data mining algorithm is a new method for predicting reservoir oil and gas production. The method is based on a combination of three different methods: (1) the first method includes estimating the pressure drop of each well according to the original pressure, which is obtained by drilling down through the formation. This can be accomplished by using any type of logging tool, or even simply by using an electronic measuring instrument. (2) The second method involves predicting the time required for each well to produce fluids at different pressures.

**Keywords:** Reservoir engineering, Prediction of liquid production capacity, data mining.

**Paper ID
ICAISC 2666**

# Certificate-Free Aggregate Encryption using Elliptic Curves

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## Abstract

Having efficient and safe cryptographic techniques for online data exchange is now more important than ever with the rise of the use of cloud computing & the Internet of Things. In a perfect world, those storing data or files online would utilize encryption and provide selected individuals the keys to access such files. with the idea of aggregation, which enables users to decode several kinds of data with an individual key of constant size, is a modern and efficient proposal in this area. For online data sharing, we offer a dynamic key aggregating encryption technique that works on elliptic curve groups and permits dynamic withdrawal of user access rights. We extend this fundamental architecture to a generic two-tiered hierarchical structure that not only effectively permits expansion of data classes but also achieves optimum space and temporal complexity. Finally, we offer an addition to the generalized method that makes it possible to perform encryption and decryption using efficiently computable bilinear pairings. Formal proofs are provided that each scheme is semantically secure. All of the paper's assertions have been verified by actual experiments.

**Keywords:** Certificateless Public Key, Aggregate signcryption (ASC), Elliptic Curve, Random Oracles (ROs).

**Paper ID
ICAISC 2678**

# Deep Learning based Dual Image and EMG Signal Low Back Pain Detection Methodology

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## Abstract

Non-specific low back pain (nLBP) has steadily increased in prevalence with the rise of sedentary and inactive lifestyles among the general population. It is important to identify the affected muscles so that therapy may be tailored to the individual. Despite this, current approaches for recognizing affected muscles rely heavily on clinicians' expertise and lack objective criteria. Most biomedical signal-based diagnostic tools, including surface electromyography (sEMG), can only distinguish between patients and healthy controls. Since it relies on human-created characteristics, EasiSMR is only one work capable of identifying symptomatic muscles; nonetheless, its accuracy is limited. In this article, we offer Proposed work, a system that uses deep learning to identify the muscles that are causing non-specific low back pain. Its raw sEMG signal is converted into both frequency and time domain sEMG first. The data is then sent into a heterogeneous two-stream multitasking deep learning system that analyses each input independently based on its unique properties. In addition, we include the muscles' compensation information into our multitask neural network architecture and propose Spanning CNN to enhance recognition accuracy. Finally, we verify our system's performance by designing and implementing a waist-belt-shaped wirelessly sEMG monitoring and processing system.

**Keywords:** Backpain Detection, Deep Learning, Dual Data, EMG and Image.

# Research on the Application of Intelligent Algorithms in Communication Power Supply Monitoring System

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## Abstract

In the communication power supply system, the maintenance and management of communication power equipment is a very important part. To ensure the normal operation of the communication system and achieve remote monitoring and management of equipment, it is necessary to establish a complete power monitoring system. On this basis, this paper analyzes the application of intelligent algorithm in the communication power supply monitoring system. First, it introduces the basic concept of intelligent algorithm and the basic mode of system application. Second, it selects the intelligent algorithm. Based on the selected algorithm, it carries out the system design work to make the algorithm applied. Finally, it analyzes the application performance of the algorithm combined with the case. Through research, the application of intelligent algorithms in communication power monitoring systems can improve equipment operation stability and management efficiency.

**Keywords:** communication power supply, intelligent algorithms, communication power monitoring system.

# English Translation Intelligent System Based on Artificial Intelligence and Data Fusion Technology

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## Abstract

As people communicate more and more around the world, the accuracy and timeliness of language communication are becoming more and more important. To solve multilingual, 24h, anytime, anywhere translation and communication services, these anytime, anywhere, short-term, multilingual translation services require the help of computers, big data, artificial intelligence, virtual agents, language intelligent judgment and other technologies. This paper aims to study the design method of intelligent English translation system based on artificial intelligence and data fusion technology. This paper proposes a new method for machine translation based on artificial intelligence and data fusion technology. Using the concept categories of HNC theory as semantic information to fuse with the neural network on the source language encoder side, two different fusion methods of horizontally mixing HNC concept category information and vertical splicing HNC concept category information are proposed, and verification experiments are carried out. The results show that compared with the attention mechanism-based neural machine translation baseline model RNNSearch, the method of integrating concept networks can improve the model by 1.48 BLEU values and reduce 1.76 TER values. Case analysis and other aspects have better performance. The research of neural machine translation integrating concept network is a beneficial attempt to combine rationalism and empiricism in the field of machine translation, which enriches the model architecture of neural machine translation and provides new ideas for the research of semantic machine translation. Experiments have shown that the current mainstream translation system in the market has a BLEU value of 6.62 lower than that of general texts for professional text translation, and 42% of the errors are in terminology translation. The lower response speed is lower than 0.05s.

**Keywords:** Artificial Intelligence, Data Fusion, English Translation, Neural Network.

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## The Wireless Multimedia Communication Network Adapts to the Bandwidth Configuration Online Optimization Algorithm
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## Abstract

Wireless multimedia communication networks have completely changed the way we communicate and share information. With the emergence of online optimization, this technology has become more efficient and can adapt to different bandwidth configurations. Online optimization allows real-time adjustment of the Bandwidth allocation of the network to ensure that each user can obtain the best bandwidth to meet their needs. This means that users can enjoy high-quality multimedia content without encountering buffering or lag issues. In addition, this technology enables seamless integration between different devices and platforms, allowing users to access multimedia content anytime, anywhere. Wireless multimedia communication networks also provide a secure platform for sharing sensitive information, making them an important tool for enterprises and organizations. In short, wireless multimedia communication networks have made significant progress since their inception. With online optimization, it has become more versatile and adaptable to meet the constantly changing needs of modern communication. Undoubtedly, this technology will continue to shape our world in ways we cannot imagine. This article proposes wireless multimedia communication to optimize wireless multimedia communication. Firstly, broadband data is classified using bandwidth configuration standards and selected based on communication adaptation to achieve online optimization of broadband data. Then, based on communication adaptation classification, a systematic evaluation set is formed and the evaluation results are analyzed. MATLAB simulation shows that wireless multimedia communication has a high degree of optimization for wireless multimedia communication. The compliance rate of broadband adaptation is better than that of standard optimization methods.

**Keywords:** bandwidth configuration; Standards; configuration; wireless multimedia communication; System.

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## Design of Computer Software Engineering Machine Vision Platform Based on Traditional Image Algorithms
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**Hui Gao**

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## Abstract

Machine vision systems can effectively improve production efficiency and accuracy. However, existing machine vision technologies are difficult to meet standards. Therefore, this article used traditional image algorithms to design a machine vision platform for computer software engineering. Traditional image algorithms can further improve the efficiency and accuracy of machine vision by denoising and enhancing images. This article designed a computer software engineering machine vision platform based on traditional image algorithms, achieving an average efficiency of 85.6% and an average accuracy of 94.6% for machine vision. The final conclusion drawn in this article is that the application of traditional image algorithms can effectively improve the production efficiency and detection accuracy of machine vision platforms.

**Keywords:** traditional image algorithms, machine vision platform, computer software engineering, eccentricity.

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## Interior Design and Decoration Style Based on 3D Computer Software and Virtual Reality Technology
</td></tr>
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**Chen Wen**

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## Abstract

Since the advent of hand drawn sketches and solid models, interior design and decoration have made significant progress. With the emergence of 3D computer software and virtual reality technology, designers can now simulate it realistically before designing. This technology allows designers to experiment with different layouts, colors, materials, and lighting in a virtual environment. They can test different furniture layouts or wall colors without moving anything. This saves time and money, while also allowing for more creativity in the design process. Virtual reality technology goes further, allowing customers to experience it before the future space is built. They can walk through their new home or office and feel how it looks and feels in real life. This immersive experience helps customers make better decisions about their design choices and ensures that they are satisfied with the final result. Overall, 3D computer software and virtual reality technology have made the interior design industry more efficient, creative, and customer-centric, thus completely transforming the industry. This study is based on the design of indoor space and decorative style. This study will create a model using 3D computer software, virtual reality technology, and special cameras, which can be used as a prototype for creating internal spaces. The main purpose is to explore the possibility of creating three-dimensional models with interior design styles. In addition, we also want to explore people's feelings in different spaces through virtual reality technology.

**Keywords:** Interior design; Computer 3D software; Virtual reality technology; Decorative style.

<table>
<tr><td></td><td># Research and development and design of intelligent home furnishing based on 5G</td></tr>
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## Abstract

The 21st century has entered the 5G era, and one of the most direct application areas of 5G is the smart home. Smart home helps families keep information communication with the outside, optimize people's lifestyle, help people effectively arrange time and improve life efficiency. However, there are still some problems of inconsistent standards in the field of smart home, relatively single product functions, and lack of interconnection between home appliances. This research is aimed at the planning and design of 5G intelligent home furnishing software system, and conducts the two-way communication with home appliances through the wireless communication network (433MHz radio frequency communication). The main work contents are as follows: Design and develop a home control system with "graffiti cloud" as the platform, equipped with CMT2300A RF communication module, WRG1-WiFi module, to realize the mutual conversion between different protocols, transmit control commands and control the terminal equipment.

**Keywords:** 5G, smart home control system, design scheme.

<table>
<tr><td></td><td># Research and Application of Business English Practice System Oriented to Cloud Computing Platform</td></tr>
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## Abstract

In order to obtain better business English learning effect, an online business English practice system based on cloud computing platform is proposed. First, the business English online practice system framework of the cloud computing platform is designed, and the infrastructure layer is adopted to provide users with all facility services. Through the platform service layer, functions such as application development, testing and hosting are provided to users. According to the user's knowledge points and question type scores, the software service layer evaluates the user's business English learning status. The test results show that under the condition of concurrent application, the upper limit of the CPU occupancy rate of each function of the system in the research is about 13%, and the upper limit of the memory occupancy rate is lower than 8%. This value meets the criteria for computer application of the system in the research. Result finding, this system overcomes the limitations of the current English online practice system, has good fluency, low resource utilization, and can improve the learning effect of business English for users, with high practical application value.

**Keywords:** cloud computing platform; business English online practice; knowledge points; question type score; learning status.

<table>
<tr><td></td><td># Application and Research of Venue Construction System Based on Unity 3D</td></tr>
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## Abstract

Virtual community is the specific application of virtual reality technology in the digital era. Virtual community reproduces the landscape and architecture of the real community, enabling people to roam on the computer through virtual reality equipment. This project simulates and models the three-dimensional scene of the community, arranges the landscape of the community through Unity 3D, and designs and implements interactive functions, browses the landscape of the community, and plans and designs the scene of the community, It is also possible to establish a virtual interactive experience place on this basis. Through the virtual community, people who have no chance to visit on the spot can have a strong sense of experience. At the same time, it also provides reference for peer research on the construction technology of interactive scenes.

**Keywords:** virtual reality, Unity 3D, 3D modeling, Roam.

# IoT Based Automated Poultry Farm for Layer Chicken using Artificial Intelligence Techniques

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## Abstract

The poultry business has a considerable impact on the food manufacturing sector. Poultry hens are in high demand, but there are growing worries over their quality in many parts of the world. Quality control in the poultry sector helps to ensure a steady supply of eggs and meat. The industry's stakeholders benefit from recent technical developments in the tracking and monitoring of bird health. To address this issue, the authors present a system that uses a combination of a (LSTM-RF) to extract features from chicken images in an effort to boost identification accuracy. In order to test the efficacy of the suggested LSTM-RF despite the imbalanced dataset, many data improvement strategies were developed. When applied to chicken age detection, the suggested model increases accuracy to 95%, as shown by the final testing results. In addition to the aforementioned mobile-ready detection software, this study also presents the design of a comprehensive image-acquisition system for aviaries. Also, a more accurate and high-performing classification approach is provided by comparing the accuracy of several classification models. The main goalmouth of the investigate is to deliver a prognostic service framework based on the Industrial Internet of Things (IoT) that can more precisely categorise fowl hens in real time.

**Keywords:** Poultry industry, Random Forest, Industrial Internet of Things, Chicken Age Detection.

# Orderly Charging and Discharging Scheduling of DC V2G Charging Pile Considering Load Balance of Electricity Reticulation

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## Abstract

Power system stability is an important problem in the development process of the electricity reticulation, and with the large-scale EV access to the electricity reticulation, its charging and discharging behavior to the planning and operation of the power system has a greater impact, and bring challenges to the safe and stable operation of the electricity reticulation, so the maintenance of electricity reticulation load balance becomes more and more important. Therefore, this paper designs the pre-stage AC/DC converter and the post-stage bi-directional DC/DC converter as the topologies of V2G charge-discharge machines. The mathematical models of AC/DC converter and bidirectional DC/DC converter are established. Combined with the driving and parking time characteristics of EV a spatial-temporal distribution model of parking demand and a V2G load capacity model of EV were established to promote the orderly scheduling of charging and discharging of charging piles. The experimental results show that the orderly charging of EV based on V2G Tech can significantly reduce the peak load of the grid, and the peakvalley difference of the balance load of the grid reaches 31.6%. Improve the stability of electricity reticulation load. In addition, the EV group feeds the distribution network during the peak period, which reduces the total load peak by about 8.2% and relieves the load pressure of the distribution network during the peak period.

**Keywords:** power network load balance, EV charging and discharging, DC V2G, optimal scheduling.

# Data Security Technology in Electronic Commerce System Development

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## Abstract

Data security technology is an important aspect of e-commerce system development. With the increasing number of online transactions, ensuring that sensitive information such as credit card details and personal data is protected from unauthorized access has become a top priority. The use of encryption technology is a method of protecting data in transmission, ensuring that data is not intercepted by hackers. Another important aspect of data security in e-commerce systems is the implementation of access control. This involves restricting access to sensitive information to only authorized personnel who need it for their job function. In addition, regular audits should be conducted to ensure that all users comply with security policies and procedures. In summary, data security technology plays a crucial role in the development of e-commerce systems. It helps protect sensitive information from unauthorized access and ensures that customers can confidently transact online. With the continuous growth of online transaction volume, enterprises must prioritize data security measures to protect customer trust and loyalty. This article first analyzes the problems of data technology in e-commerce development systems, and then proposes construction strategies for business system development from the perspective of data technology.

**Keywords:** E-commerce, System development, Data security technology.

# A Comprehensive Analysis on Deep Learning based Image Retrieval

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## Abstract

Image retrieval is a computer vision task that entails looking for images that resemble a particular query image in a sizable database. By using visual similarity or other factors, image retrieval seeks to empower users to locate images that correspond to their interests or requirements. The image processing stream is recognized as an essential module since a lot of systems use logic to map inputs to outputs. Semantic gaps prevent some conventional text- and content-based picture retrieval techniques from reflecting the human perception of images. The primary aim of this paper is to provide a research survey on traditional Deep Learning based image retrieval techniques along with their advantages, disadvantages, and limitations. This study focuses on the issues in Content Based Image Retrieval (CBIR), such as the semantic gap that develops among image pixels with a low level (collected by machines) and image pixels with a high level (collected by humans). The extensive approach supports researchers to attain greatest solutions for the present issues in CBIR. The accuracy, precision, recall, and f-score are measured key parameters for determining the efficiency of image retrieval techniques.

**Keywords:** content-based image retrieval, computer vision, deep learning, image processing, semantic gap.

# Artificial Intelligence Based Lung Cancer Prediction Using Convolutional Neural Network Algorithm

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## Abstract

Medical imaging equipment is essential for the prevention of lung cancer and for monitoring lung cancer patients while they are receiving therapy. For this generation, and for the foreseeable future, lung cancer will continue to be the major cause of cancer-related deaths. If lung cancer signs are identified early, treatment may be available. Sustainable prototyping models for lung cancer therapy can be created using recent advancements in artificial intelligence without having a negative effect on the environment. Reduce the amount of wasted resources, work, and time needed to accomplish manual tasks, saving time and money. For people, estimating movement using conventional techniques is challenging. Due to this, some machine learning algorithms provide efficient and quick predictions with low error on uncertain raw data. The proposed method use Artificial Intelligence (AI)-based Convolutional Neural Networks (CNNs) to build efficient models to identify high-risk groups for lung cancer, allowing early detection to avoid long-term complications from intervention. Initially, dataset images collected from standard repository. Then, started the image preprocessing stage to reduce the noises ad imbalanced data from the image dataset. Second stage is segmentation step is segmenting each image features based on the thresholding algorithm. Then, the features color equalization using for set several methods that make an effort to change or enhance the aesthetic appeal of an image. Thirdly, feature extraction from preprocessed stage photos. Extraction of features based on maximum threshold weight using Support Social Spider Optimization (S3O) involves selecting the values of features. Before classification, the features must be evaluated using the SoftMax activation function to estimate the feature weights. Finally, Classification based on AI based CNN algorithm evaluating the risk factors uses the proposed model, and each feature obtained from the softback activation function receives its input from the model's final fully linked layer. A combination of AI based CNN and softback layers yields 96.52% accuracy. The proposed model is a stable and consistent diagnostic model for lung cancer detection.

**Keywords:** Artificial Intelligence, Medical image, lung cancer, Artificial Intelligence Based Convolutional Neural Network (AI-CNN), Support Social Spider Optimization (S3O), features, Softmax, layers, Classification.

# The Application of University Computer Network Course Teaching Platform Based on Moodle+LAMP Technology

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## Abstract

In order to solve the shortcomings of Moodle's question bank exercise activity module and make it better meet the specific needs of this course, a college computer network course teaching platform based on Moodle + lamp technology is proposed. Using Moodle's development technology and lamp to design and develop the exercise subsystem of the question bank, using the knowledge of software engineering to increase the possibility of its implementation, and finally designed and implemented the system, and investigated the implementation effect. Compared with the original question bank exercise module in four aspects, the system has improved and convenient topic import function, supports comprehensive random volume issuance, the operation is simple and fast, and improves the flexibility of the system. The result finding that the "feedback" activity was launched in the Moodle platform, and a simple survey was conducted on 40 students participating in the teaching experiment, and 36 answered, indicating that the teaching of College Computer Foundation Based on Moodle + lamp environment is effective. Most students are willing to accept this kind of learning, it proves that the platform improves the course activity function supported by the teaching platform and helps students learn the course better.

**Keywords:** Moodle, mixed learning theory, teaching platform, lamp, question bank exercise system.

## Design of Safety Management System for Housing Construction System based on Genetic Algorithm

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## Abstract

In order to explore the potential correlation among the factors that cause major construction safety accidents, a mining pattern of association rules based on genetic algorithm is constructed. The appropriate fitness function is established by combining the support degree and confidence rate. The adaptive crossover and mutation probability are used to find the common item set, and a large number of misleading rules are introduced to filter the interest rate. The experimental results show that the model effectively overcomes the shortcomings of genetic algorithm, such as premature, slow convergence and repeated scanning data sets, resulting in low efficiency.This article first introduces genetic algorithms, their theoretical basis, basic principles, characteristics, and applications. Subsequently, the description and components of the standard genetic algorithm were proposed, and its operation process and application steps were described. Subsequently, the implementation technology and algorithm design of genetic algorithms were introduced. Finally, an example was provided to illustrate the process of implementing genetic algorithms in application creation. This fully reflects the important role and broad application prospects of genetic algorithms in the development of innovative architectural design.

**Keywords:** genetic algorithm, housing construction system, security management.

## Security Management Strategy of Financial Data Based on Intelligent Assignment of Role Permission

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## Abstract

The financial secondary data center needs to fully benefit from the data platform, integrate the management system, and fully integrate the business data, realize the automation and intelligence of financial audit through the deeply integrated data sharing platform, broaden the traditional financial supervision function, and mine and utilize enterprise data. Based on WRPTAC and NCV60 permission model, this paper describes the roles and permissions required by workflow, and constructs the application process structure of this model. Make the data of the system safer, easier to maintain and distribute to all users. The conclusion of this study is to use WRPTAC and NCV60 permission model, and use adaptive function items to deal with the given operation permission of the system, thus creating permission management for our department. Permission management makes the data of the system more secure, easier to maintain and distribute to all users.

**Keywords:** intelligent distribution of role rights and financial security.

## The Methods of Visually Impaired Navigating and Obstacle Avoidance

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## Abstract

Blindness is a widespread problem that affects people all around the globe. People with this condition have a very difficult time navigating on their own and seeing impediments. Thus, an integrated implementation of the Web of Things & predictive analytics is necessary for properly recognizing impediments. For the blind and visually handicapped to be able to move about freely, they need to be able to sense obstacles and be warned of their presence. First, data on the location and kind of barrier has to be collected, and only then can it be sent to those with visual impairments through other means of communication, such as speech. Using the tensor flow object identification model and the Google voice model, we demonstrate a solution to assist the visually handicapped. The idea has two main parts: environment data and an analytical representation. Using a tensor flow object detection model, it first attempts to analyze the surroundings for obstacles that visually impaired individuals are likely to encounter, and then it tries to relay that knowledge to those persons in the form of spoken words.

**Keywords:** Visually Impaired People, Navigation and Obstacle Detection and Deep Learning Techniques.

| Paper ID ICAISC 3731 |

# Analysis of Automatic Recognition Algorithm of Robot Visual Shape Features Based on Genetic Algorithm

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## Abstract

Robot vision is an important aspect of computer science and artificial intelligence research. It mainly simulates human visual function through computer application technology, and analyzes and processes the information extracted from the image to achieve the actual detection and control effect. Firstly, this paper introduces the shape analysis method combining genetic algorithm and visual algorithm. Through the analysis of the results of the motion analysis experiment of the automatic mobile robot in linear motion, the actual theoretical speed is 0.199m/s, and the robot analyzes the turning motion of the mobile robot at a speed of 0.2m/s, and the actual turning speed is 0.2m/s, and the one-time optional turning is 360. Finally, this paper mainly analyzes and studies the feature recognition and classification methods of workpieces based on machine vision to help people better understand the classification and recognition technology of machine vision.

**Keywords:** robot, genetic algorithm, visual shape algorithm, improved A * algorithm.

| Paper ID ICAISC 3760 |

# Construction and Experimental Evaluation of Document Causality Extraction Model Based on CGCN-BERT

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## Abstract

With the increasing degree of networking, the amount of document data also increases. The document causality extraction method is a new data regression analysis technology. In this paper, the Central Graph Convolutional Networks-Bidirectional Encoder Representation from Transformers (CGCN-BERT) text classifier was used to label and filter keywords. This approach can make it easy to extract and judge the causal relationship of documents. Therefore, this paper explored the construction method of document extraction model under this model. This paper mainly used the methods of statistical analysis and experimental comparison to study the document relationship extraction model of CGCN-BERT. The experimental data showed that in the three document tests, the average recall rate was 86.57%, but its accuracy was as low as 67.77%, and the relationship value G was 78.63%. Therefore, the relationship extraction model designed in this paper has some room for improvement.

**Keywords:** CGCN algorithm, BERT model, document analysis, causality, extraction model.

## Distribution Network Planning Method for Sourcenetwork-storage Collaboration

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## Abstract

This article introduces a distribution network planning method for source network storage collaboration. This method is based on the principle of minimizing power grid investment and operating costs, and improves the economy and reliability of the collaborative system through collaborative optimization of source, network, and storage. Specifically, this article proposes two optimization models: the source network storage collaborative optimization model and the storage device selection optimization model, and solves these models using genetic algorithms and other methods. In addition, this article also proposes two distribution network planning schemes based on microgrids and multi energy storage systems, and conducts simulation analysis on the IEEE-33 node testing system. The results show that compared with traditional methods, the source network storage collaborative optimization method proposed in this paper has significant advantages in multiple aspects such as comprehensive economy, power grid stability, safety, and environmental protection. Therefore, this method provides an innovative approach and method for the field of distribution network planning, which can provide reference for dispatch departments and promote more optimized distribution network planning.

**Keywords:** Source network, load and storage collaboration; Distribution network; Game theory.

## Hadoop based data mining and short-term power load forecasting

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## Abstract

In recent years, Hadoop based data mining and short-term power load forecasting have become increasingly popular. This is because the amount of data generated by the power system is increasing exponentially, making it difficult for traditional methods to handle such a large amount of data. Hadoop is a distributed computing system that allows for processing large datasets across multiple computers. It has become a popular data mining tool because it can handle a large amount of unstructured data. Short term power load forecasting is an important application of Hadoop based data mining. It includes predicting the amount of electricity that will be consumed within a given period of time, usually within the next 24 hours. This information is crucial for energy companies as it helps them plan their operations and ensure that they have sufficient supply to meet demand. In summary, Hadoop based data mining and short-term power load forecasting are important tools for efficient management and operation of energy companies. As the amount of data generated by the power system continues to increase, these tools will continue to play an important role in ensuring reliable and sustainable energy supply. In this article, a situation was considered where users must implement short-term power load forecasting technology on the Hadoop platform to estimate the maximum possible power consumption for a period of time in the future in an hour or less. This can be achieved by using HBase as data storage and Spark cluster as processing engine.

**Keywords:** Short term electricity, Hadoop,  Data mining, Load forecasting.

# An Analysis of Elliptic Curve Cryptography Secret Keys For Use In Cloud Workload Balancing And Security Provisioning

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## Abstract

Cloud computing becomes increasingly popular that delivers dynamic scalable infrastructure for different applications, platforms and file/data storage. In cloud, security and resource sharing are major concerns which obstruct the growth of cloud computing. Many researchers have designed methods like Homomorphic Encryption, Fully Homomorphic Encryption (FHE), secure multiplication protocol, max-min algorithm, Ant Colony Optimization (ACO), etc., for enhancing security and cloud-based services. The major problem existed in these methods was computation complexity, lower level of security, high execution time and resource failure. To overcome these problems, we concentrate on fine grained security and resource provisioning in cloud platform. For security, Homomorphic encryption scheme is performed based on Elliptic Curve secret key analysis which produces security against intruders and third party. This encryption scheme enhances cloud security based on secret key sharing between cloud users and data owners to securely access the data. Simultaneously, resource sharing is also involved which maintains multiple users and schedules their jobs into resources without failure. Independent clustering is designed for dynamically balancing user's workload with significant parameters. Clustering process is mainly involved in separating workload and reducing time to allocate the resources. Our proposed environment is simulated with CloudSim which evaluates the proposed security scheme in terms of computation time, data protection rate, encryption/decryption time and the improvements in workload balancing is studied with execution time and VM migration.

**Keywords:** Web crawler, deep learning, improve web crawler algorithm.

# Research and Simulation of Improved Topic Web Crawler Algorithm based on Deep Learning

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## Abstract

This article analyzes the limitations of traditional topic crawlers, and on this basis, compares depth first and breadth first crawling strategies to construct an improved topic URL crawling strategy. By using regular expressions and web page selectors to locate actionable positions in a webpage, the program simulates human operations on the webpage based on these positions, in order to obtain more topic related URLs and webpage content. Finally, by establishing the experimental process of themed crawler, designing and improving the themed web crawler algorithm, and finally comparing and analyzing the experimental results, it is shown that the improved URL crawler strategy in this paper can greatly reduce the number of total urls crawled by crawler, reduce the crawling time, and improve the efficiency of unit crawler crawling target themed web pages.

**Keywords:** Web crawler, deep learning, improve web crawler algorithm.

# Research on Distributed Multi-Task Learning System Based on Data Analysis Algorithm

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## Abstract

This paper presents a research study on distributed multi-task learning systems based on data analysis algorithms. The paper starts by providing an introduction to distributed multi-task learning and data analysis algorithms, along with their importance in machine learning and artificial intelligence applications. The background section provides a more detailed discussion of these concepts, highlighting their specific applications and challenges. The paper then focuses on data analysis algorithms, discussing their types, features, and usage in different applications, including distributed multi-task learning. The paper also highlights some of the popular data analysis algorithms, such as clustering, classification, regression, and dimensionality reduction, along with their mathematical formulations and applications. The section on distributed multi-task learning provides an overview of its concepts, benefits, and challenges. The paper then discusses some of the popular algorithms used in distributed multi-task learning, such as Bayesian methods, transfer learning, and multi-task feature learning, along with their mathematical formulations and applications. The paper concludes by discussing some of the recent research trends in this field, including the use of deep learning and reinforcement learning in distributed multi-task learning systems. Overall, this paper provides a comprehensive overview of the distributed multi-task learning system based on data analysis algorithms, highlighting its importance and potential in various applications.

**Keywords:** distributed multi-task learning, data analysis algorithms, multi-task feature learning, deep learning, clustering.

# Adaptive Improved Genetic Algorithm in Structural Damage Detection System of Civil Environment

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## Abstract

In structural damage detection of building engineering, adaptive improved genetic algorithm can effectively transform complex and high-dimensional problems into simple ones, and can accurately identify and classify components. Based on the characteristics of building structures, this paper studies an improved genetic algorithm to improve the accuracy of damage detection of civil structures. In this paper, the experimental method and the comparative method are mainly used to compare and analyze the structural damage detection results with different improved algorithms. The experimental data shows that the error is less than 1% by observing the detection result of the target function 2, and the positioning effect of the whole structure is relatively stable.

**Keywords:** Adaptive Improved Genetic Algorithm, Civil Environment, Structural Damage, Detection System.

# Construction of a Blockchain Cross-Border e-Commerce Traceability Security System Based on Genetic Algorithm

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## Abstract

The quality of the products of China's foreign trade import and export companies is very different, and it is difficult to formulate a unified standard. The return of cross-border goods is very difficult, and the company's expenses are also large and cannot be traced. Based on the blockchain model of genetic algorithm, it discusses in detail how to build a traceability security system for cross-border e-commerce. Especially in terms of encryption technology, genetic algorithms have been used to conduct in-depth research on blockchain, giving full play to its decentralized, secure, transparent, regular and traceable characteristics. By comparing the traditional genetic algorithm and the construction of the traceability security system of cross-border e-commerce based on genetic algorithm, this paper draws the conclusion that the construction of the cross-border e-commerce security system based on genetic algorithm is more effective.

**Keywords:** Traceability security system, building cross-border e-commerce, Blockchain, genetic algorithm.

# Analysis and Design of Insertion Loss of EMI Filter Based on Improved Differential Evolution Algorithm

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## Abstract

The main way to suppress interference on power lines is to use EMI filters, which are typically characterized by insertion losses. However, in practical use, even if the insertion loss design of an EMI filter meets the standard, it is possible that the optimal filtering effect may not be achieved due to changes in source impedance and load impedance. Aiming at the above problems, this paper discusses the definition of insertion loss of EMI power filter, and gives the basic principle of improved differential algorithm. Relying on the improved difference algorithm, this paper presents an actual calculation example, and verifies that the simulation results have high accuracy through comparison with the measured data. In this paper, using modeling and simulation instead of experimental procedures can improve the design efficiency of EMI filters, while reducing the design cost of EMI filters.

**Keywords:** insertion loss, EMI filter, improved differential evolution algorithm.

# The Successful Key Division Using Chord, Pastry, and Kadmelia

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## Abstract

In general, key distribution is the process of giving out the public key to the members present in the network. However, the distribution of secret key still remains a problem in most of the network. With the view of proposing an efficient key distribution algorithm, in this project we have demonstrated the key distribution under three different network scenarios as (i) Chord (ii) Pastry and (iii) Kadmelia. In this project, we have considered the peer-to-peer (P2P) network for implementation. Also, the chord and pastry are the overlay and routing network types that are used for the implementation of distributed hash table. Meanwhile, Kadmelia also supports distributed hash table routing but constructs the virtual overlay network. In order to generate the hash value, we used the SHA-1 (Secured Hash Algorithm). For each scenario, we implement three algorithms such as (i) Present Encryption, (ii) Routing Information Protocol (RIP) and (iii) Emperor Penguin Optimization (EPO). The present encryption is used for data encryption during the transmission and the RIP ensures that is no packet drop. Moreover, the EPO algorithm is used for selecting the next forwarder during query passing in the P2P network. The experiment was performed in the simulation environment of NS 3.26 and the results are presented. The entire scenarios are evaluated under the performance metrics such as packet delivery ratio, throughput, overhead and end-to-end delay. The experimental results proved that the key distribution is better in the scenario of pastry network. This is because of the efficiency in the network topology as well as the deployed algorithm.

**Keywords:** Chord Ring, Kadmelia Network, Key Distribution, Pastry Network, SHA algorithm.

# Hardware and Software Partitioning Method of Embedded System based on Immune Algorithm

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## Abstract

With the rapid development of embedded system and microelectronics technology, the integration of hardware is getting higher and higher, which makes it possible to integrate CPU, memory and I/O devices into a silicon chip. SoC has gradually become the mainstream of embedded system design technology with its high integration, good reliability, short product launch cycle and other characteristics. However, with the increase of system complexity, the traditional design methods have been unable to meet the requirements of system design. Hardware partitioning is the process of creating a "hard drive" for each application. This allows you to install multiple applications on a single computer and move them as needed without having to reinstall the entire operating system or lose data. Software partitions are similar, but you will create virtual drives to install software applications instead of having a hard drive for each application. The main difference between the two methods is that each individual application has its own physical storage space (such as RAM) through hardware partitioning. Through software partition, all programs are stored in one place, which can share RAM.

**Keywords:** Embedded, Immune algorithm, systems software, system hardware.

# Application of Levelset-Based Algorithm in the Design of Digital Economy Management System

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## Abstract

Due to the emergence of information technology, the digital economy has gradually become the main thrust to promote the rapid development of China's economy. The development of digital technology has gradually changed the structure of the digital economy market, and the algorithm has replaced the human factors in the economic management system. However, the relevant digital economy management theory has not kept up with the pace of The Times, and it is difficult to accurately develop the growing digital economy management services. This paper introduces the definition and principle of Levelset algorithm and the key to the interface capture, put forward the Levelset algorithm of medical images, digital economy eye contour recognition and tracking important areas of learning and research, prove that various information technology algorithms in the digital economy, Levelset algorithm outstanding utility and digital industry. In this way, Levelset algorithm is worth research and development, and is very conducive to becoming a fuel for digital economy.

**Keywords:** Levelset algorithm, digital economy, management system, economic management.

# Investigation on Multi-Objective Optimization System of Wastewater Treatment Process Based on Artificial Intelligence

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## Abstract

With the rapid development of economy, the sewage treatment process is becoming more and more mature, but there are still many problems. This paper mainly studied the multi-objective optimization method based on the combination of Artificial Intelligence (AI) and multi-objective to achieve the extraction, classification and prediction of heavy metal elements in urban sewage. Based on the single factor control, a multilevel, comprehensive and dynamic distributed fuzzy neural network model was established. The appropriate algorithm was selected according to the characteristics of pollutants under different parameters, and the system design idea and overall layout under multiple constraints were proposed. Finally, the theory was verified by the example. The experimental results showed that the performance of the sewage treatment system optimized by AI was gradually stable, and the concentration of pollutants after treatment was about 380m3d-1.

**Keywords:** artificial intelligence, sewage treatment, multi-objective optimization, system research.

# Multidimensional Time Series Prediction Based on WOA-BP——A Case Study of Wordle

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## Abstract

In recent years, the development of technology has led to an explosion of multi-platform heterogeneous data, and multi-dimensional time series prediction can bring rich benefits to enterprises. Traditional time series prediction models fail to capture the complex relationships between feature variables. To address this issue, this paper proposes a prediction model based on WOA-BP, which uses BP neural networks to fit the nonlinear relationships between multi-dimensional time series features and optimizes the BP neural network parameters through the WOA algorithm. The research results show that the model has good prediction performance (RMSE=2.7718) and can provide assistance for management decision-making.

**Keywords:** multi-dimensional time series, ARIMA, BP neural networks, WOA.

# Analysis of Multiple Information Collaboration Mode in Public Emergency Management Based on Blockchain Technology

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## Abstract

This article explores the construction and optimization of a diversified information collaboration model for public emergency management based on blockchain technology. Firstly, the basic concepts and characteristics of blockchain technology were introduced, as well as its application in public emergency management. Then, a diversified information collaboration model for public emergency management based on blockchain technology was proposed, including information sharing, information transmission, information collaboration, and other aspects. Subsequently, the advantages and disadvantages of this model were analyzed, and its feasibility and effectiveness were verified through practical cases. Finally, the problems and challenges faced by this model were discussed, and corresponding suggestions and prospects were proposed. The research results of this article provide certain reference value for improving the efficiency and level of public emergency management.

**Keywords:** public emergency management, blockchain technology, multi information collaboration, public safety.

# SRNN-MAFM-based Unimodal Text Sentiment Analysis

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## Abstract

Sentiment analysis, a crucial task in natural language processing (NLP), involves extracting subjective information from text data to understand public opinion, market trends, and brand reputation. This research introduces a groundbreaking unimodal text analysis system called StackedRecurrent-Neural-Network with Multi-level Attention and Feedback module (SRNN-MAFM) for sentiment analysis. The proposed system employs advanced techniques to perceive sentiment in texts and categorizes them into three extreme sentiments: positive, neutral, and negative. The sentiment analysis module utilizes a Boolean structure and an OR operation for classification. The study includes a Python platform simulation using the STS-Gold datasets to evaluate the proposed technique. The simulation results demonstrate that the proposed unimodal text sentiment analysis technique achieves an impressive accuracy of 97.8%, outperforming existing methods. This research contributes to the advancement of sentiment analysis and provides a highly accurate and efficient solution for analyzing sentiment in unimodal text data.

**Keywords:** sentiment analysis, unimodal text, classifier, feature extraction, deep learning, multi-level attention, and feedback module.

# A Planning and Evaluation Algorithm of the Smart Grid Innovation Demonstration Area Based on Big Data

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## Abstract

Smart grid planning is the main content of the development of the power industry, but the manual grid planning is not reasonable enough in the work management, and the management scheme is not perfect enough. In the context of big data, it can carry out management work scientifically and reasonably, and formulate a perfect management plan. Based on this, this paper proposes a big data intelligent evaluation method to promote the rational operation of smart grid. The results show that the smart grid of big data can improve the stability and reliability of data information. The effectiveness is greater than the artificial grid planning method the smart grid planning of the big data is more suitable for the sustainability of the development of the power industry.

Keywords: electricity, smart grids, big data, planning, algorithm.

# Construction of Ship Heterogeneous Network Positioning System in View of NNA

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## Abstract

China's seaborne imports in 2022 will decrease by about 18.8% compared with 2021, and will increase significantly in 2023 with the remission of the epidemic. The data displayed in the system can provide an important pillar for China's future import and export trade and even navigation technology. Global Navigation Satellite System (GNSS) is an important basis for navigation and plays a vital role in navigation. However, this traditional positioning system has obvious shortcomings in prediction accuracy and anti-interference, and more scientific algorithms are urgently needed to avoid these shortcomings. In this text, a ship heterogeneous network positioning system in view of neural network acceleratorengine (NNA) is proposed, and various simulations are constructed to verify the effectiveness of the proposed control design. The results show that the anti-interference effect (AIE) under the NNA is maintained at more than 90%, while the traditional AIE is less than 70% on average. Therefore, it would be a great importance to study the construction of ship heterogeneous network positioning system in view of NNA.

Keywords: Neural network algorithm, heterogeneous network, ship positioning system, simulation experience.

# Genetic Algorithm and its Application in Software Test Data Generation

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## Abstract

Genetic algorithm is a computational technique that simulates the process of natural selection to solve complex problems. It has been widely applied in various fields, including software engineering. One of its applications in software engineering is test data generation. Test data generation is an important component of software testing, aimed at ensuring the quality and reliability of software systems. However, generating effective test data can be challenging and time-consuming, especially for complex systems with large input domains. Genetic algorithm provides a solution to this problem by using population based search methods to generate test data that meets specific criteria. This algorithm starts from the initial population of random test cases and iteratively evolves them through selection, crossover, and mutation operations until a satisfactory solution is found. The effectiveness of genetic algorithms in generating test data has been proven in various studies. It has been proven to generate various effective test cases, covering different parts of the input domain, and revealing hidden faults in the system. In short, genetic algorithms are a powerful tool for software engineers to generate effective test data for complex systems. Its application can significantly improve the quality and reliability of software systems by identifying hidden faults that may not have been discovered. In this study, we analyzed genetic algorithms in current software testing, controlled them based on model data and generation structure in software testing, and obtained effective calculation methods based on various genetic algorithms. By using traditional genetic algorithms and various swarm genetic algorithms to analyze the distribution and optimal value interval of two curves, it is shown that various swarm genetic methods have strong optimization ability, high accuracy, and can quickly jump out of local optima to obtain the final solution. They are a very effective optimization algorithm.

**Keywords:** genetic algorithm; software testing; data generation.

# Construction of an Information System for English Learning Platform Based on Genetic Algorithm

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## Abstract

Currently, the process of transforming learning platforms from traditional to modern is at a crucial juncture, marking a significant period of transition in the field of informatization. The swift advancements in information technology, encompassing digitization, informatization, and intelligence, are instigating consequential shifts in English learning, driving the pursuit of modernization. The advent of information technology has engendered the epoch of personalized learning. The focal point of this study resides in the contemporary state and developmental trajectory of English pedagogical reforms within university settings. By centering on universities as the primary research subjects, this article delineates the disharmonious occurrences encountered during the amalgamation of conventional language instruction and modern educational technology. Furthermore, it delves into the construction of a novel English learning information system, employing methodologies while scrutinizing the causes of disharmony through the lens of educational ecology. Moreover, it ventures forth with audacity to explore methods aimed at mitigating and eradicating the discordance. The objective is for the research findings of this article to be effectively implemented in English instruction, providing valuable insights and augmenting the current pedagogical landscape.

**Keywords:** genetic algorithm, platform informatization, English learning, algorithm system construction.

# IoT - Healthcare Based Model for Heart Diseases Classification

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## Abstract

The rising prevalence of cardiovascular disorders has led to a substantial improvement in their diagnosis. Despite the fact that several techniques have been created for illness classification and privacy protection for safe data transfer, most of these techniques still have problems with precise decision making. In the field of clinical data investigation, the expectation of cardiovascular activity is a fundamental test. Artificial intelligence (AI) has matured into a useful tool for sifting through the mountain of data produced by medical professionals and health organisations to make informed decisions and forecasts. Machine learning techniques are helping doctors better predict heart attacks, and this has led many people to alter their behaviour in the future to avoid a similar fate. This study looks at two data sets, one from UCI and one from Kaggle, to make predictions about cardiovascular illness. The results obtained by applying the suggested model to these two datasets are competitive with current approaches. The heart disease prediction model presented here makes use of a Dual path network with recurrent convolutional cascades. Both the individual channel and the inter-channel connection are taken into account when employing LSTM. Then, layers that are completely interconnected occur. For this reason, the proposed system outperforms preexisting smart heart disease prediction systems by a wide margin, with an accuracy of 91.7% and 93.7%, respectively, when tested on the UCI and Kaggle datasets, respectively.

**Keywords:** heart disease monitoring scheme, Deep convolutional neural network, Internet of things, Artificial Intelligence, Long Short-Term Memory.

# The Modeling of Uncertainty in Planning of Smart Transmission Grid based on Artificial Intelligence

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## Abstract

Power grid planning is an important part of power grid topology, but there are many uncertainties in the original manual planning method. This paper proposes an artificial intelligence method to analyze the intelligent planning of transmission network and improve the research of power grid topology, optimize factors such as subjective planning uncertainty and objective planning uncertainty. The modeling topology data is then comprehensively evaluated. Finally, continuous monitoring is used for intelligent planning of the transmission grid and the final planning results are output.The artificial intelligence method can accurately carry out the intelligent planning of the transmission network and remove the intelligent planning of the transmission grid There are a lot of uncertainties. Therefore, artificial intelligence methods can meet the requirements of intelligent planning of transmission grids and are suitable for transmission network planning Continuous development.

**Keywords:** artificial intelligence, smart grids, grid planning, uncertainty.

# A Local Fault Location Method of Distribution Network based on Ant Colony Algorithm

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## Abstract

Local fault location is the main contented of distribution system management, but in the course of distributing electric energy, the fault of load and protection device will affect the excellence of power supply and reduce the timeliness of local fault location. Based on this, this paper submissions an ant colony method to analyze the local fault location, advance the management equal of distribution network, and abbreviate the fault diagnosis time. The lowvoltage pulse detection data is then comprehensively evaluated. Finally, continuous monitoring is used to locate local faults and output the final power quality. The results display that the ant colony algorithm can exactly locate local faults, improve the level of local fault location, and the timeliness is greater than 93%, which is better than the low-voltage pulse detection method. Therefore, the ant colony algorithm can encounter the requirements of local fault location and is appropriate for continuous study of distribution network management.

**Keywords:** ant colony algorithm, local fault location, distribution network management, load, malfunction of the protective device.

# Financial Distress Prediction of Small and Medium-Sized Enterprises based on Artificial Intelligence Technology

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## Abstract

In order to further improve the financial management quality of small and medium-sized enterprises, provide scientific and efficient financial information support for enterprise operation decisions and minimize the probability of enterprises falling into financial difficulties and crises caused by factors such as increased economic uncertainty, a financial distress and crisis management method based on machine learning algorithm is proposed with artificial intelligence technology supported. Empirical research was conducted on smes financial distress, with the help of random forest and other four machine learning models to manage financial distress and crisis. The experimental results show that the prediction accuracy of LR model is improved to 0.9061, SVC model to 0.9049, NB model to 0.8720. The result finding that the financial distress and crisis management method proposed in this article based on machine learning algorithms is effective, the accuracy of financial management and forecast can be effectively improved by controlling the variables of macro factors.

**Keywords:** Machine learning, Small and medium-sized enterprises, The financial management.

# Evaluation of Modeling Strategies for Fashion Design Process Based on DCGAN Algorithm

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## Abstract

With the development of The Times, there are more and more types and patterns of fashion design, and people have more and more choices to buy clothes. However, among the increasing number of clothes, there are some poor quality clothes, so how to further improve the quality of clothes is very important. This paper studies the modeling strategy analysis of the clothing design process based on the DCGAN (Deep Convolution Adversarial Networks) algorithm. That is, the clothing design process is modeled through the DCGAN algorithm, and then the optimal design scheme is obtained. In this paper, the maximum fit of clothing using DCGAN algorithm is 93% and the minimum is 80%, while the maximum fit of traditional clothing is 75% and the minimum is 68%. Through this experimental data, it can be seen that DCGAN algorithm has a good effect on clothing design and has a high degree of fit with clothing design.

**Keywords:** fashion design, modeling strategy, DCGAN algorithm, design modeling.

# Deep Learning Algorithm and Video Image Processing-based Basketball Training System

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## Abstract

The training of basketball players is a complex and hard work. In the game, how to finish the ball quickly and accurately, and how to improve the goal rate and score through correct and effective methods. This paper first introduces the deep learning algorithm and analyzes its basic idea, then expounds the data mining based on the pixel method and the preprocessing of the original data from the two aspects of feature extraction and modeling, and finally uses the experimental results to prove that MATLAB can be applied to the video retrieval, motion recognition and other fields in the basketball training system to achieve efficient basketball game score statistics and teaching guidance.

**Keywords:** deep learning algorithm, video image, basketball training, system application.

# Key Technologies of Intelligent Recommendation Based on Spatio-Temporal Bicontinuous Tourism Information Management

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## Abstract

In the past, many tourists chose travel destinations based on the recommendations of friends or experts who have been to the destination, or according to the recommendations of local residents. Based on this background, this paper studies the key technology of intelligent recommendation based on spatiotemporal bicontinuous tourism information management, as an extension of spatiotemporal delay personalized tourist attractions algorithm. This paper designs the database of the tourist information recommendation system, realizes the seamless integration and integrated storage management of spatial data and attribute data, and facilitates data maintenance and sharing. This paper chooses the appropriate computer programming language to realize part of the functions of the tourism information management system, mainly including tourism information query, urban traffic information system, tourism planning system, and formulate tourism route planning and tourism routes for the scenic spots that tourists will visit. Experimental research shows that this paper introduces the concept of core users into the scenic spot type as an influencing factor for similar user recommendation. Analysis shows that in terms of data processing capabilities, the performance of the algorithm proposed in this paper is more than 20% better than other algorithms.

**Keywords:** Spatio-temporal bicontinuity, information management, intelligent recommendation, travel system.

# Construction of Wearable Physical Exercise Management System based on Artificial Intelligence Technology

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## Abstract

With the advent of the era of networking and big data, wearable devices have gradually been integrated into people's healthy life due to their mobility and portability, and have shown their value and status in sports and health. This paper mainly studies the construction of wearable physical exercise (WPE) management system based on artificial intelligence technology. By analyzing the building elements of sports relationship system, the wearable sports management system modules are designed, including sensor calibration module, data transmission module, data acquisition module and sports data analysis module. The realization and performance test of the system are carried out. The results of the performance test show that the physical exercise management system designed in this paper can meet the needs of daily use.

**Keywords:** artificial intelligence, wearable devices, physical exercise, management systems.

## Research on the Influences of Network Characteristics of Digital Economy Industry Based on Big Data Intelligent Analysis Algorithm

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## Abstract

In recent years, China has promoted the deep integration of the digital economy and the real economy to build a digital industrial cluster with international competitive influence. As the fastest growing and most potential economic growth point, the digital economy has become an important development strategy in China and has been widely concerned by all sectors of society. This paper establishes the input-output correlation network model between industries in the national economic system, and uses the big data intelligent analysis algorithm to conduct a detailed and in-depth statistical analysis of the main statistical attributes of the input-output correlation network between industries, such as network density, degree centrality, betweenness centrality and closeness centrality to point out the position and role of each industry in the national economy to analyze and study the industrial structure of the national economy.

**Keywords:** digital economy industry, network characteristics, big data intelligent analysis algorithm.

## Prediction of Oxygen Carrier Performance in Chemical Chain using Different Machine Learning Algorithms

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## Abstract

Chemical chain is a series of chemical reactions in organisms or environment. The rate of these reactions depends on the oxygen concentration in the surrounding environment. If there is not enough oxygen, the chain will not move forward as fast as there is more oxygen. This can be seen from the experiment. Put the iron filings on a piece of paper, and then put them in an oxygen-free environment to observe the speed at which they start to rust. Screening of low-cost and high-performance oxygen carrier materials is the key to the future commercial application of chemical chain technology. More than 1000 materials have been tested as oxygen carriers under chemical chain conditions. Among them, ores and industrial by-products as oxygen carriers have recently attracted attention. They have low cost and convenient supply, especially their full reactivity with solid fuels. However, these materials have highly variable components, which affect their performance in the chemical chain. It is costly to test them one by one by using test methods. Support vector machine can avoid the over-fitting phenomenon of neural network in small sample training set. The sensitivity analysis showed that the change of manganese content of oxygen carrier had a greater impact on the reaction characteristics, while the specific surface area had a smaller impact.

**Keywords:** Chemical chain combustion; Oxygen carrier; Machine learning; Artificial neural network; Support vector machine.

## Simulated Annealing Hybrid Genetic Algorithm for Industrial Heritage Evaluation Model Construction

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## Abstract

The "subjective" renewal of industrial heritage(IH) will bring some uncertain losses to our IH culture, so it is necessary to analyze the value of IH quantitatively and construct the IH evaluation model(EM) objectively and realistically. In this paper, under the guidance of the current situation and theories of the evaluation system(ES) of heritage value at home and abroad, we combine the current situation of the ES of IH in China and construct the EM of IH based on the simulated annealing hybrid Genetic Algorithm(AHGA) as the entry point; briefly analyze the theory of simulated annealing algorithm(SA)A and the construction of the EM of IH value; discuss the operation process of the imagery construction evaluation and SAA of IH. Finally, simulation experiments are conducted for IH evaluation based on simulated AHGA. The results show that the results based on simulated AHGA are more accurate than single genetic algorithm(GA) and SAA, and there are fewer iterations and simpler steps when running the program, while laying the foundation for further heritage conservation and landscape renewal strategies to be proposed.

**Keywords:** annealing hybrid genetic algorithm, industrial heritage, evaluation model, simulation constructs.

## Optimization and Prediction of Logistics Network Structure

**Paper ID**
**ICAISC 5648**

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## Abstract

This article first predicts the daily freight volume for each route in January 2023 based on quartiles and the Prophet time series model. Specific forecasting results for DC14 to DC10, DC20 to DC35, and DC25 to DC62 are obtained. The first-day freight volume for DC14 to DC10 is 29365.788. Furthermore, this article establishes optimization models for shutting down DC5 and DC9, respectively, and obtains the freight volume under normal and abnormal circulation. After shutting down DC5, the number of changing routes on the first day under normal circulation is 2, and the load is 21249.3. Then, the logistics site and route are evaluated for their importance based on the entropy weight method, the analytic hierarchy process, and the gray absolute correlation degree group decision-making model. Finally, the load rate of the constructed network is calculated to be 0.136, indicating good robustness.

**Keywords:** prophet time series model, optimization model, logistics network, group decision-making model.

## Numerical Solutions of Stochastic Kdv and Burgers Equation Driven By Multivariate Gaussian Measure

**Paper ID**
**ICAISC 5694**

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## Abstract

This paper mainly discusses the application of multivariate Gaussian measure to KdV and Burgers equation. This paper used generalized polynomial chaos expansion (PCE) method and constructed multivariate orthogonal polynomials for arbitrary multivariate random variables, based on Gram-Schmidt orthogonalization(GSO). An example stochastic initial-value problem illustrates the generalized PCE approximation effects. Numerical experiments demonstrates that the method leads to superior accuracy and efficiency, meanwhile applied the method to stochastic KdV equation and stochastic Burgers equation driven by multivariate Gaussian probability measure.

**Keywords:** PCE, Tensor-product, Gram-Schmidt orthogonalization, Multivariate orthogonal polynomials, Multivariate Gaussian measure.

## Optimization of Emergency Logistics Network based on Cloud Platform

**Paper ID**
**ICAISC 5722**

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## Abstract

To improve the stability and timeliness of the emergency logistics system, the urgency of time and the need of multi-objective decision-making in the urban emergency logistics system are fully considered, as well as the situational factors such as road safety that may occur in the process of material distribution, while meeting certain cost characteristics in the actual distribution process. An emergency logistics mode scheme based on cloud platform is proposed. By analyzing the uncertain factors in the main problems of urban emergency logistics, and incorporating the uncertain factors with large influence factors into the research system of urban emergency logistics, it can ensure that the urban emergency logistics activities meet the specific practical requirements. On this basis, the improvement of urban emergency logistics system is proposed. We are also building an emergency logistics model based on the cloud platform to reduce the cost caused by information asymmetry and improve the efficiency of emergency material distribution. Genetic algorithm with monarch scheme is used to optimize the S-flow path of emergency materials based on cloud platform. The experimental data show that the emergency logistics of the severely affected cities has reduced 36.49% of the cost and saved 27.87% of the time through the cloud platform. Result finding that the cloud platform proposed in this paper can shorten the transportation time, reduce the distribution cost, find the optimal distribution route of materials, and has good stability and application value.

**Keywords:** Emergency logistics, Optimization problem, Cloud platform, Material distribution, Distribution route.

# Design and Application of a Moral Education Evaluation System Based on Big Data

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## Abstract

Moral education in universities is an important component of higher education, which is related to the cultivation of higher talents. Traditional moral education evaluation mainly uses manual scoring, which is inefficient and subjective. Therefore, this article proposes a student moral education evaluation system based on big data. This system draws on other educational evaluation systems and takes into account the characteristics of moral education evaluation. This article provides a detailed explanation of the design scheme of the system and tests its functions. Result finding that when the number of users of the system increases, the system can still run stably and respond accordingly. During this process, the time consumption did not increase significantly, and the performance continued to remain stable. Moreover, the response time of this system was compared with other moral evaluation systems and the results show that it is significantly higher than other evaluation systems. The quality evaluation system for college students' moral education can improve the efficiency of moral education evaluation, reduce office costs, and further improve the informationization level of moral education work.

**Keywords:** Support vector machine; Expert scoring; College students moral education; Comprehensive evaluation; Big data.

# Design of Offline Verification System for Safety Valves of Special Equipment Based on Improved KDE Algorithm

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|---|---|---|
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## Abstract

The offline calibration system for equipment safety valves has become a hot topic in the past few years. The importance attached to equipment safety has become an important issue in contemporary times. The latest progress and existing problems in the research of soil quality evaluation index systems and evaluation methods at home and abroad were summarized and analyzed, and some suggestions were put forward for future algorithm research activities. This article first provides a specific explanation and definition of the concept of improved KDE algorithm, and then demonstrates the viewpoint by constructing a data model. Finally, by analyzing and evaluating existing offline verification systems, it is demonstrated that there are certain problems with the current verification system. To address the issues of inconvenient management, low work efficiency, inaccurate data, and inconvenient transportation of safety valves for offline calibration of special equipment safety valves, the safety valve calibration system is networked, informationized, with high accuracy of calibration results, high calibration efficiency, and cost reduction. An improved algorithm has been proposed to provide reliable data support for the calibration of special pressure equipment and provide new references for the offline calibration operation specifications of safety valves. Therefore, how to design and apply an offline calibration system for safety valves of special equipment is a highly worthy research topic. In the experimental analysis, the performance of the improved KDE algorithm was tested. The offline calibration system of the equipment safety valve based on the improved KDE algorithm has a monitoring accuracy rate of more than 90%, which can provide a safer guarantee.

**Keywords:** offline verification of safety valves, standardized operation, automatic control, high efficiency.

# Accuracy Assessment of Industrial Heritage Mapping Based on GA+BP Neural Networks Forecast

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## Abstract

With the gradual implementation of the protection project today, when the heritage has more favorable preservation conditions, the development of The Times requires us to change the original protection idea on the basis of "repair", and turn the focus to science, systematic research, and complete management of heritage information. Starting from the collection and collation of heritage information, a set of relatively perfect heritage archives database has been established. It has promoted the historic transformation from passive rescue protection to active systematic and preventive protection. The establishment of a perfect heritage information database is the premise to achieve this transformation, and the establishment of an efficient and practical data management system is the foundation. This puts forward high requirements for the record and management of heritage. Therefore, this paper proposes to use GA+BPNN to predict the surveying and mapping accuracy of industrial building heritage, pay attention to the processing of "information", and carry out preliminary processing of surveying and mapping information according to the "ideal model". After experimental training on GA+BPNN model, the accuracy forecast of industrial building heritage through BP neural channel is made. Through comparative analysis, GA+BPNN has a better effect on the accuracy forecast of industrial architectural heritage. There are absolute errors in the GA+BP combination model, and the relative errors and predicted values are 0.7488mm, 0.0972% and 13.0772 mm, respectively. The forecast results are good. It also has certain reference significance for the surveying and mapping of industrial building heritage.

**Keywords:** GA+BPNN, industrial building heritage, surveying and mapping accuracy, forecast assessment.

# Realization of Embedded Basketball Video Target Tracking Algorithm Based on DSP-FPGA

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## Abstract

At present, when using the target tracking algorithm to track embedded basketball sports videos, due to the accumulation of errors, the tracking drift and the inability to deal with the occlusion of the target result in the long execution time of the target tracking algorithm and the small number of successfully tracked and marked targets. The realization of the embedded basketball video target tracking algorithm based on DSP-FPGA is a project aimed at developing an embedded system for basketball video target real-time tracking and analysis. This algorithm uses digital signal processor (DSP) based on FPGA and customized software and hardware components to achieve target tracking algorithm. The solution can be used in monitoring, sports, medical and military fields. This paper introduces the work of developing target tracking algorithm using DSP - FPGA platform.

**Keywords:** Embedded, DSP-FPGA, Target tracking algorithm, Basketball.

# Public Security System and Construction Method based on Cloud Edge Computing

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## Abstract

The world is becoming more and more dangerous, and information security is becoming more and more important. In order to protect information, we need to use various methods, such as encryption, authentication, authorization, etc. However, these traditional methods are not suitable for the current cloud computing environment because they are too complex to meet the requirements of real-time operations. Therefore, some researchers in this field have proposed a new method called "cloud edge computing". Cloud computing is a new IT service that provides shared resources on the Internet. It can be used to store, share and process data in a flexible and cost-effective manner. Cloud computing can be divided into three types: public cloud, private cloud and hybrid cloud.

**Keywords:** Cloud edge computing; Public safety system; information safety.

# Research on Simulation and Analysis Software for Interior Environment Design Based on 3D Virtual Vision

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## Abstract

With the improvement of living standards, people are no longer satisfied with the needs of indoor environmental design only in terms of material functions. Visual virtualization and tactile perception have also become important indicators to determine indoor environmental design. Based on this, the visual model of interior environmental design has become a new focus in the design field. This article analyzes the three-dimensional virtual vision of indoor environment design in combination with theory and practice, and uses 3DMAX software to design indoor environment. The visual sense of indoor environment allows users to have a better visual scene aesthetic feeling, promoting the quality of indoor environment design in software design.

**Keywords:** interior design, Virtual indoor, 3D virtual vision, Environmental simulation.

# Implementation of Secure Login and Access Methods for Web Frontend

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## Abstract

This article mainly explores the implementation of secure login and access methods for web front-end. By using measures such as HTTPS encryption, multi-layer authentication, firewalls, access restrictions, and strong password policies, the security of web applications can be improved. We have achieved different results by implementing these strategies, among which using multi-layer authentication and HTTPS encryption is the most effective method. The data table and result analysis provided in this article can provide reference for developers to build more secure web applications. Finally, we emphasize that protecting the security of user information and application resources is crucial for the development and application of web frontends.

**Keywords:** Web front-end, secure login, access method, big data algorithm.

# Knowledge Graph Service System Based on Data Fusion Technology

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## Abstract

With the advent of the knowledge explosion and the era of big data, various disciplines are developing towards a more refined direction, and various disciplines are constantly intersecting and integrating. This requires a new way of knowledge organization, display, and management, namely the knowledge graph. It can connect knowledge between disciplines to form a knowledge centered network, achieving better integration and utilization of various resources. Therefore, this article conducted research on a knowledge graph service system based on data fusion technology. Firstly, knowledge graph, service system, and data fusion technology were explained in detail. Then, the superiority of data fusion technology for knowledge graph service system was analyzed through experiments. This article studied a knowledge graph service system based on data fusion technology, aiming to effectively manage, showcase, and utilize knowledge from different disciplines, and achieve better integration and utilization of various resources.

**Keywords:** knowledge graph, service system, data fusion technology, system study.

# Application and Innovation of Cloud Computing Technology in Computer Data Processing

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## Abstract

Cloud computing technology has completely changed the way computer data is processed. It involves using remote servers to store, manage, and process data, rather than relying on local servers or personal computers. The application of cloud computing technology in computer data processing has many advantages. Firstly, it allows easy access to data from any location through an internet connection, making it easier for businesses and individuals to collaborate and share information. Secondly, cloud computing technology provides scalability as users can easily increase or decrease storage capacity according to their own needs. Thirdly, it provides a cost-effective solution, as users only pay for what they use. However, there are also some concerns about the security and privacy of data stored in the cloud. Therefore, appropriate measures must be taken to ensure that sensitive information is not subject to unauthorized access. In short, the application of cloud computing technology in computer data processing has changed the way we store and manage information. Its benefits outweigh the challenges, making it a popular choice for businesses and individuals. The main advantage of using this technology is that it can provide multiple functions for multiple people to use simultaneously. This can more effectively utilize resources and reduce costs related to hardware maintenance. Cloud computing also provides access to information from different sources, allowing users to obtain the information they need faster than before.

**Keywords:** Cloud computing, Data processing, Computer.

# Application and Innovation of Cloud Computing Technology in Computer Data Processing

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## Abstract

By analyzing the common problems in the teaching implementation of modern teaching system based on the background of network platform, combining the theory of deep learning theory and personalized learning theory, using artificial intelligence technology, the paper is aimed to design and analyze an intelligent learning guide system. Machine learning and deep reinforcement are made further research during learning and teaching. Its main object model, system structure and operation mechanism as well as the key problems of research are described. Through the experiment and comparation before and after, we find this kind of intelligent learning guide system can effectively solve the drawbacks of network teaching and realize personalized and intelligent teaching. It shows that the system promotes the development in this field and makes a great contribution to enhancing learners' learning skills and improving the learning quality.

**Keywords:** intelligent tutoring system, computer technology, deep learning

# Research and Application of Support Vector Machine Algorithms Based on Artificial Intelligence Optimization

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## Abstract

The data of four typical driving conditions were collected from real vehicles, and the training and testing samples of driving condition recognition were extracted and expanded by the random number method, and the data were processed by using multivariate statistical theory, and the driving condition recognition was carried out based on an artificial intelligence optimization algorithm: the support vector machine (PSO-SVM) algorithm with particle swarm optimization. The influence of the recognition period and update period on the accuracy of online recognition of driving conditions is analysed. The driving condition recognition technique is applied to the energy management strategy of plug-in hybrid electric vehicles. The simulation results show that, compared with the grid search algorithm driving condition recognition technique and the energy management strategy using the traditional SVM algorithm for condition recognition, the PSO-SVM algorithm based driving condition recognition accuracy is improved by 3.44%, and the battery state of charge (SOC) changes relatively smoothly, which is conducive to improving the system efficiency and extending the battery life.

**Keywords:** Driving condition recognition, Particle swarm optimization, Support vector machine (SVM), Plug-in hybrid electric vehicle.

# Design of Visual Information Model of Blockchain Intelligent Interactive Data

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## Abstract

Visual information model design needs to integrate with big data sharing, intelligent interaction, authentication security, model building, optimization and energy saving, node privacy and other aspects to give play to the important role of blockchain intelligent interactive data. This paper builds a visual cognitive model around knowledge graph and intelligent interactive data, proposes multiple structures, thinking cognition, multiple modules and intelligent data, and aims at multiple visual cognitive paths of "driving task-effectiveness activity -- map visualization -- intelligent interaction -- model processing" and "data rotation -- information graph -- multiple knowledge -- cognitive model". It draws the conclusion of the multi-distributed and information intelligentized non-center model structure, realizes the openness, transparency and traceability of all kinds of information data, and makes the blockchain intelligent interactive data more visualization, intelligence, humanization and technicalization. According to the intelligent type media of blockchain, large databases are stored and classified, and a partition block data model is established. A chain structure relationship is formed between block data models, and a layer by layer oriented structure is formed. The representation design and interaction design of blockchain intelligent interactive data visualization need to meet the requirement that the cognitive subject and artificial intelligence can work cooperatively and integrate, so as to create a compound cognitive block model.

**Keywords:** blockchain, intelligent interactive data, visual information, cognitive model, data visualization.

# HPLC Communication Isolation Technology Based on Communication Signal Isolation Technology to Achieve Communication Network Topology Level

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## Abstract

With the rapid development of communication isolation network topology, computer network has penetrated into all fields of society and become the backbone of the information age. Moreover, with the increasing expansion of network scale, network management is facing higher and higher requirements and greater difficulties. As the basis of network management, network topology detection will help network managers better understand the network situation, carry out security prevention and optimization management, which is of great application value and practical significance. Therefore, network topology detection has become one of the research hotspots in the field of computer network. Corresponding to OSI (Open System Interconnection) seven-layer network model, network topology detection can be divided into network layer topology detection and data link layer topology detection. This paper analyzes the basic principle of communication network topology realized by HPLC isolation and the research status of network topology detection at home and abroad, and improves the topology detection methods of communication network layer and link layer respectively. In the aspect of network layer topology detection, this paper proposes a personalized topology detection method using both Simple Network Management Protocol (SNMP) and Internet Control Message Protocol (ICMP) protocols and hierarchical detection strategy. The algorithm adopts a hierarchical detection strategy, which divides the network topology detection into two levels: the first level topology detection uses SNMP to detect the routing devices and subnets in the network; The secondary topology detection uses ICMP protocol to detect the active hosts in the subnet and the type of subnet. Moreover, the hierarchical strategy of the algorithm is similar to the hierarchical structure of the communication network, which can well reflect the hierarchy of the network. In the aspect of data link layer topology detection, by analyzing and comparing the topology detection algorithms based on bridge republication and bridge spanning tree, a comprehensive data link layer topology detection method combining address forwarding table and spanning tree is proposed.

**Keywords:** HPLC Communication Isolation Technology to Realize Network Topology, Signal Communication, Signal Isolation Technology, Topology Diagram.

# Feature extraction strategy of translated text based on Neural Network

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## Abstract

In order to better solve the problems of difficult processing of information in text semantics, too much artificial prior information, and unstable performance in traditional natural language processing, a text feature extraction method based on neural network was proposed on the basis of relevant theories of neural network. This method constructs a translation model based on neural networks and an improved deep neural network feature extraction strategy. In order to enable the deep learning model to better handle the semantic content of translation, this paper first designs a semantic based translation segmentation model, which improves that the existing translation segmentation algorithm is not suitable for single semantic segmentation, and this model can also model language in training, and use the deep learning neural network to provide high-quality translation semantic word vectors for other natural language processing systems. In addition, we conducted a separate word segmentation test for sentences with semantic ambiguity, and then analyzed the existing hidden Markov model, maximum entropy Markov model, conditional random field model and other models based on traditional machine learning algorithms, as well as the advantages and disadvantages of deep learning algorithms such as LSTM sequence tagging model, LSTM-CRF sequence tagging model and Bi LSTM-CRF model. Through algorithm training, the proposed improved algorithm model iterated over 21 corpora. The result finding that the single stack bi LSTM CRF model constructed by a single-layer LSTM neural network was chosen as the final model in this paper. A total of 21 iterations of the corpus were trained, and the accuracy of all labels was 98.70%. On the development set, the recall rate is 89.31%, with a peak F score of 93.88. In addition, the accuracy of the test set obtained in the experiment was 97.81%, the recall rate was 83.94%, and the F-value was 90.35 points. This article improves the neural network structure in Bi-LSTM-CRF and obtains the performance of existing models on the named entity recognition test set.

**Keywords:** Neural network, Translated text, Feature extraction, LSTM-CRF.

# Performance Analysis of Load Balancing Mechanism in Cloud Computing

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## Abstract

The advancement of Information Technology has made cloud computing technology an innovative model for offering its consumers services on a rental basis at any time or location. Numerous firms converted to cloud technology by establishing new data centers because of the flexibility of cloud services. However, it has become necessary to ensure successful job execution and effective resource usage. Load balancing (LB) in cloud computing remains a complex challenge, specifically in the Infrastructure as a Service (IaaS) cloud architecture. A server being overloaded or underloaded is a problem that mustn't happen in the process of cloud access because it would slow down processing or causes a system crash. Hence, to ignore these problems, a suitable resource schedule must be taken, so that system can load balance tasks over all accessible assists. This research suggests effective load-balancing approaches by analyzing the advantages, applications, and disadvantages of conventional LB techniques. The conclusions show that this research provides an exceptional path for researchers to overcome major drawbacks of existing LB techniques and achieves greater efficiency based on makespan, execution and response time, resource usage, efficiency, load balancing and throughput.

**Keywords:** cloud computing, infrastructure as a service, load balancing, performance analysis, resource utilization.

**Paper ID
ICAISC 6578**

# An Automated Irrigation System for Agriculture Using IoT

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## Abstract

Smart irrigation is a cutting-edge method of water management that makes use of cutting-edge technology to enhance irrigation procedures. To choose the ideal quantity and time of water application for crops or lawns, this system combines sensors, weather information, and computer algorithms. Smart irrigation systems help to preserve water resources, cut down on water waste, and boost crop yields by only giving plants the water they require. Additionally, smart irrigation has a number of benefits over conventional irrigation techniques, including simplicity in installation, enhanced control and monitoring, and increased effectiveness. An overview of the idea of smart irrigation and its potential advantages for the agriculture and landscaping industries is given in this abstract.

**Keywords:** Smart Irrigation, Computer Algorithms, Internet of Things, Sensors.

**Paper ID
ICAISC 6616**

## Research on the Design of An International Talent Evaluation System Based on Data Mining

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## Abstract

In order to boost the quality of international talent evaluation and promote the rapid development of the internationalization of higher education, data mining techniques were applied to international talent evaluation. The implementation standard of international talent evaluation is proposed, and an international talent evaluation system is constructed based on data mining technology. In this research, the index analysis and the establishment of the index frame were systematically carried out for modeling by extracting the index from data mining and applying it to real-time evaluation. The weight of each index was obtained by using the analytic hierarchy process and the expert consultation method. To ensure the accuracy of the index scores, the different grade options under each index were normalized, and the construction of the scientific research ability evaluation model was completed. This method broadens students' international horizons through applied analysis and strengthens students' international-oriented professional knowledge.

**Keywords:** Big data, International talent, Evaluation model, Analytic hierarchy process, Information base, Data mining.

# Impacts on Voltage Regulation Arising from Photovoltaic Generators Connected To Medium and Low Voltage Electric Grid

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## Abstract

The work deals with ways to regulate the voltage in low-voltage distribution networks using inverters of photovoltaic power plants. Compared to the current state, where inverters only supply active power, he is investigating the way in which it would be possible to supply reactive power as well, with which the voltage could be regulated. The work contains a research of currently proposed reactive power control methods and proposes a new method that combines reactive power regulation with active power so that it better matches the characteristics of the low voltage distribution network.

**Keywords:** PV inverters, Reactive power control, Voltage control, Distributed sources.

# Induction Motors Parameters Identification by Starting Process Using Quantum Particle Swarm Optimization-Trust Region Algorithm (QPSO-TRA)

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## Abstract

A thorough understanding of the induction machine parameters is necessary for practically all applications' control techniques in order to maintain high-quality dynamic and steady-state drive performance. However, as it directly affects the effectiveness of the control systems, the higher accuracy of IM parameters is crucial for all industrial processes. Out of the five electrical parameters ($R_s$, $R_r$, $X_s$, $X_r$, and $X_m$), only four parameters, $R_s$, $R_r$, $X_s$, and $X_m$, can be independently estimated by the parameter estimation algorithms disclosed in the current literature, while the core loss resistance $R_{fe}$ is ignored. The method for predicting induction machine parameters during startup is presented in this study without the use of any assumptions. Two instantaneous voltage and current waveforms recorded during a direct startup are used to estimate the parameters. The six electrical parameters of the IM ($R_s$, $R_r$, $R_{fe}$, $X_s$, $X_r$, and $X_m$) can all be independently determined using the suggested parameter estimating approach utilized in this study. The weight of computing is also a significant issue for real-time data processing. This work offers a less time-consuming approach based on QPSO-TRA approach to address these issues. The suggested approach involves transforming the drawbacks of earlier algorithms to create a trustworthy hybrid algorithm to discover all IM parameters devoid of any assumptions. Comparing this hybrid method to the traditional genetic algorithm (GA), the computation load can be cut in 1/3. A 5.5kW induction motor was used to assess the effectiveness of the suggested strategy using the Matlab software program.

**Keywords:** induction motors, parameters identification, starting process, quantum particle swarm optimization, QPSO-TRA.

**Paper ID**
**ICAISC 6736**

# Construction of Higher Vocational Education Platform Based on Artificial Intelligence

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## Abstract

In response to the current problems of insufficient application capabilities of teachers, insufficient implementation rules and learning resources, inadequate guarantee mechanisms, and a lack of top-down top-level architecture, it is proposed to construct a higher vocational education platform from the perspective of artificial intelligence. The hardware structure consists of the functions of each system module. In the student learning module, there are coordination coordinators and various representatives who are responsible for displaying specific learning materials, solving problems, sharing cooperative knowledge, and providing the basis for autonomous learning in the system. Through the student login interface, individual login operations are completed. SQL Server 2000 is used as the database server to design the software functions, and the online assessment of data is carried out with the determination of data attributes, and the vocational teaching is completed by combining with the network technology. The experimental results show that when the time is 10 seconds, the teaching efficiency using traditional systems is 88%, and the teaching efficiency using artificial intelligence systems is 59.9%; When the time is 20 seconds, the teaching efficiency using traditional systems is 91%, and the teaching efficiency using artificial intelligence systems is 61%; When the time is 30 seconds, the teaching efficiency using traditional systems is 61%, and the teaching efficiency using artificial intelligence systems is 92%; When the time is 40 seconds, the teaching efficiency using traditional systems is 62%, and the teaching efficiency using artificial intelligence systems is 93%. Although in the beginning, artificial intelligence systems may have a delay effect, resulting in low teaching efficiency. But in the later stage, the artificial intelligence system will quickly return to normal mode, with high efficiency. Result finding that the system has high teaching efficiency and can provide equipment support for student learning.

**Keywords:** Artificial Intelligence(AI); Wireless network; Education construction.

**Paper ID**
**ICAISC 6754**

# Construction Cost Index Prediction Based on Machine Learning

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## Abstract

Construction projects have a great impact on the cost of construction in the process of carrying out construction, which is directly related to the quality of the construction of the entire project. Therefore, it is necessary to continuously improve the understanding of the construction industry. Machine learning is the use of the powerful computing power of computers, through the continuous update and recognition of data, so as to obtain a large amount of effective information. This paper presented a predictive analysis of construction project costs with the help of machine learning, with the aim of accurately calculating project costs and predicting construction costs. The paper used experimental design, case studies and data comparison to study the construction cost index. The experimental test results showed that the stability value reached a minimum of 87% and the stability of the system performed well in the three cases.

**Keywords:** machine learning, construction engineering, cost indices, prediction systems.

# Application of Artificial Intelligence in the Detection of Rotating Mechanical States

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## Abstract

This article mainly introduces the application of artificial intelligence technology in the state detection of rotating machinery. Firstly, the causes of faults in rotating machinery, detection methods, and their shortcomings were discussed and analyzed, and the limitations and challenges of traditional methods were pointed out. Next, the advantages and applications of artificial intelligence technology in rotating machinery state detection were elaborated. Specifically, it includes research progress in multiple applications such as state detection methods based on machine learning and deep learning, fault diagnosis and health prediction of rotating machinery using artificial intelligence technology, and remote monitoring of rotating machinery using artificial intelligence technology. Finally, the paper summarizes and analyzes the application of artificial intelligence technology in rotating machinery status detection from four dimensions: performance, accuracy, efficiency, and cost. The results indicate that artificial intelligence technology can greatly improve the accuracy and efficiency of rotating machinery state detection, but there is still room for improvement and unresolved issues. These problems include data quality, data volume, Model selection, interpretability, cross domain cooperation, etc. Through the discussion in this article, the aim is to provide useful reference and inspiration for practitioners in the field of rotating machinery condition detection.

**Keywords:** artificial intelligence, rotating machinery, state detection, application.

# An Accurate Detection of Drowsiness Using a Graph-Based Neural Network

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## Abstract

According to the findings of this research, a low-cost solution for identifying driver drowsiness might be the use of microsleep patterns. In contrast to the standard method, we collected pictures by putting the camera on the extreme left side of the driver and suggested two algorithms that allow reliable face and eye detections regardless of whether the driver is gazing straight at the camera or has closed his or her eyes. This was accomplished by obtaining images by positioning the camera on the driver's extreme left side. It has been recommended that a Graph Neural Network, often known as a GNN, be used in order to determine whether or not the right eye is open. The whale optimization (WO) approach was developed in order to determine which qualities are considered to be the most desirable. Eye states are utilized to identify patterns of microsleep, and an alert is then transmitted to the driver of the vehicle when one is detected. Our data set consisted of a large number of male and female participants, each of whom had unique physical traits and had been exposed to a range of lighting conditions. The suggested method achieves an accuracy of face detection of 99.9% and an accuracy of eye detection of 98.7%. The overall accuracy and precision levels of WO-GNN are, on average, 96.4 and 95.4 percent, respectively, across the board for all subject areas.

**Keywords:** Drowsiness, Eye State Detection, Graph Neural Network.

# Application of JAVA Integrating VF Programming Language in Computer Software Development

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## Abstract

With the continuous development of China's economy and society, computers have become an indispensable part of our lives. The development of intelligent life and the normal operation of computers cannot be separated from software development. The Java programming language has become the key to computer software development and is gradually becoming well-known. Based on its unique advantages, JAVA programming language has broad development prospects, and we must conduct comprehensive research on it. This article first highlights the specific features of VF programming language and C++language. This article will mainly start with an overview of the Java programming language, explore all its characteristics, and then analyze the types of Java programming languages required in computer software development.

**Keywords:** Java software development, VF programming language, C++language, Linux operating system.

# Innovative Image Privacy Preservation Applied to Data Perturbation in Cloud

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## Abstract

The proposed method is to protect the privacy of images in real-time by using encryption, salt key, and blurring techniques. The method is particularly useful in cloud environments where images may be processed or stored remotely. The method uses the Advanced Encryption Standard (AES) algorithm, which is a widely-used encryption method that is known for its security. The AES algorithm is applied to the image data, which is then protected with a unique salt key, making it even more difficult to decipher. In addition to encryption, the method also uses the Gaussian Blur algorithm to blur the image data, making it more difficult to recognize any details that might compromise privacy. This blurring technique can be adjusted to achieve varying degrees of blur, depending on the level of privacy required. Furthermore, the method applies data perturbation, which involves adding random noise to the image data. This helps to further obscure any sensitive information and makes it even more difficult for unauthorized users to extract useful data. Overall, the proposed system is a robust method for protecting image privacy in real-time, and it has many potential applications in various fields, such as healthcare, finance, and law enforcement.

**Keywords:** Data Perturbation, Gaussian blurring, Privacy preservation, Encryption

# Compound Prediction Model of Information Network Security Situation based on Support Vector Machine and Particle Swarm Optimization Algorithm

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## Abstract

The composite prediction model for information network security situation based on support vector machine is an innovative method for predicting the security situation of information networks. This model combines multiple prediction models to obtain more accurate and reliable prediction results. The SVM algorithm is used as the basic model and then combined with other models such as decision trees, neural networks, and logistic regression. The composite prediction model considers various factors that affect the security status of information networks, including network traffic, system logs, and user behavior. By using machine learning algorithms to analyze these factors, the model can predict potential security threats before they occur. The use of SVM in this model provides several advantages over traditional methods. SVM has high accuracy and robustness when processing large datasets with complex features. It also has good generalization ability and can handle nonlinear relationships between variables. Overall, the support vector machine based composite prediction model for information network security situation is a promising method that can improve network security by providing warning signals for potential threats. The purpose of this study is to develop a new information network security situation prediction model. The proposed algorithm can be used for monitoring systems, which will help us predict the future evolution of security levels for each node at different stages. Our results indicate that our method can effectively predict the evolution trend of information network security situation based on support vector machines.

**Keywords:** Information network security, Support vector machine, Particle Swarm Optimization, prediction model.

# Optimization and Exploration of the Volume Scheduling Problem in Logistics Network

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## Abstract

Compared to traditional business activities, e-commerce activities are more susceptible to the impact of logistics networks and various emergency situations. Therefore, in the event of a special situation, e-commerce operators urgently need an optimized emergency response plan. This article aims to establish a logistics network scheduling model to help operators cope with emergencies and improve operational efficiency in emergency situations. The article establishes a path planning model that considers how the logistics network can quickly plan when a warehouse or road suddenly closes, which can meet the logistics transportation requirements and minimize the number of logistics adjustments required. The article focuses on the classification integration and visualization of logistics network data, evaluates the importance of each logistics location and road, determines the workload and efficiency, dynamically adjusts the logistics sites, and discusses the impact of logistics site closures and the feasibility of this research method. The planning model developed in this article has strong reference value for the mobilization plan of real logistics.

**Keywords:** ARIMA model, immune genetic algorithm, dynamic programming, entropy weight TOPSIS.

# Analysis and Design of Integrated Service Platform for Carbon Assets of Multi-energy Entities Based on Data-driven

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## Abstract

In order to accelerate the implementation of carbon neutrality work and comprehensively improve the scientific and technological support capacity and management service level of carbon neutrality of the State Grid, this project conducts in-depth research on the construction of carbon asset integrated service platform for multi-energy entities from the perspective of carbon management of carbon neutrality. Through the technical architecture, data architecture and functional architecture of the analysis platform, a data-driven multi-energy entity carbon asset integrated service platform construction method is proposed, which forms a set of system framework with simple operation, strong scalability, high stability and close function, and takes a typical business process as a case to verify that the platform realizes the resource integration and integrated application of multiple subsystems such as carbon monitoring, carbon accounting, carbon asset management, and carbon credit evaluation. It can significantly improve the management level of carbon neutrality work, which is of great significance to the realization of the dual carbon goal.

**Keywords:** new energy cloud platform, data fusion, dual carbon business, system architecture.

# Research on Edge Computing-oriented Resource-aware Access and Intelligent Gateway Technology for Power Transmission, Transformation and Distribution

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## Abstract

This paper studies the application of edge computing and cloud-edge collaboration technology in power scenarios. Based on the existing resource-aware access technology, the technology and application research are carried out from the application architecture, access model, edge computing carrier, cloud-edge collaboration implementation, etc. This paper discusses in detail the technology of power resource-aware access and intelligent gateway for edge computing from three aspects: edge computing-oriented power resource-aware access, edge intelligent gateway design and cloud-side collaborative service. This study proposes a new cloud power resource aware access service system composed of industrial field layer, edge node layer and cloud platform layer, designs the access model of power resources for edge computing, designs an intelligent gateway with edge computing capability, and analyzes the important role and advantages of edge computing-oriented power resource aware access.

**Keywords:** edge calculation, power transmission, transformation and distribution, resource aware access, intelligent gateway.

# Graphic Model Features of Distribution Network Electrical Engineering Based on Machine Learning Algorithm

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## Abstract

With the rapid development of modern society, the power load is also growing rapidly. Whether in terms of power supply quality or power supply service, users have various demands for power. As the direct service object of electric energy, power users' outage situation and power consumption feeling will largely reflect the power supply problem in the substation area. It is of great significance to improve the quality of power supply and the satisfaction of power customers if we can combine the demands of users with the operation of distribution transformers and explore the power laws therein. The feature of electrical engineering graphic model of distribution network based on machine learning algorithm is a software that helps to create and manage distribution network with real-time data. It provides graphic models for electrical engineering students to learn different types of networks. The soft-ware can be used to design, analyze and simulate various distribution networks, such as bus, star topology, ring topology, etc. It also provides the operation of these networks under different operating conditions, such as voltage drop caused by resistance and capacitance values.

**Keywords:** Distribution network; Pattern features; electrical engineering; machine learning.

# Evaluation of Optimization Strategies for Green High-rise Office Building Design Based on Multi-objective Optimization Algorithm

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## Abstract

In stressful work, people have increasingly high requirements for an office environment. Green buildings aim to conserve resources and protect the environment through the use of new energy, with ecological and energy conservation as their main goals. The design of green high-rise office buildings is a complex and systematic process. At this stage, multiple optimization strategies need to be combined to plan it reasonably and effectively. Therefore, this article conducted relevant research on its optimization strategy with the help of multi-objective optimization algorithms, thus aiming at improving the accuracy of the strategy. This article mainly used qualitative and quantitative research methods and inductive summary methods to analyze green high-rise office buildings through experiments. Experimental data showed that multi-objective optimization algorithms obtained optimal solutions since the 35th generation, and distribution optimization had great advantages in data processing. The design of green high-rise office buildings should focus on the quality of the indoor environment, and consider the design requirements from the aspects of water resources and energy.

**Keywords:** multi-objective optimization, green design, office buildings, optimization strategies.

# Research on the Benefit of Electric Energy Replacement Carbon Emission Reduction with the Proportion of Clean Energy

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## Abstract

Traditional coal-fired heating and fuel-fired vehicles will emit a large amount of carbon dioxide gas in the use stage. Although electric energy alternative methods such as electric heating and electric vehicles will reduce carbon emissions in the use stage, from the perspective of the whole life cycle, the reduced carbon emissions in the use stage will be transferred to the electricity production stage. By analyzing the proportion of clean energy and the benefit of electric energy replacing carbon emission reduction, constructs the carbon emission reduction model of electric heating and electric vehicles, uses the LSTM model to predict the regional power generation, and calculates the renewable energy power generation and carbon emission reduction in different years. Show that the current electric energy structure cannot make the electric energy alternative method produce carbon emission reduction benefits. In 2020, the proportion of renewable energy power generation of electric vehicles should reach 29.354%, the electric heating should reach 53.781%, and the forecast result of clean energy in 2030 is 25.631%, and the carbon emission reduction benefits should not be generated at this time. This paper considers the promotion scale of electric energy substitution under environmental benefits.

**Keywords:** electric energy replacement, clean energy ratio, carbon reduction, LSTM model.

# Pre-training for Personality Assessment Through Search Engine Query Data

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## Abstract

Personality assessment through social media is a burgeoning field. Previous work has shown it is possible to compute personality from language like student diaries, tweets, but none of them has reach the search engine query data. For search engine companies, it is very important to build user profile, and understand the personality of users can promote advertising and conversion rate. Search engine data is a reliable entrance for user to express their real need and personalities. In our work, we develop a mature process to dig users' personalities from search engine data. To our knowledge, it is the first personality computing application for search engine query data. What's more, we use a pre-training frame to train model, which shows better performance than other personality computing approaches. We discover that personality assessment is beneficial for advertisement recommendation in search engine company.

**Keywords:** Personality computing, Pre-training, Search engine query

# Application of NSGA-Ⅱ Algorithm-Based Temperature Control Technology for Electrical Equipment

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## Abstract

Strengthening the temperature monitoring of electrical equipment can effectively avoid the problem of damage to equipment operating at high temperatures. With the development of China's information technology and computer technology, the temperature monitoring method of electrical equipment has received more and more attention. In view of this, electric power enterprises should combine the actual working state of the equipment and electronic technology, innovative electrical equipment monitoring work mode, and truly ensure the normal operation of electrical equipment. This paper proposes the application of electrical equipment temperature control technology based on NSGA-Ⅱ algorithm, firstly, it gives a detailed description of NSGA-Ⅱ algorithm and electrical equipment temperature control, and finally, it verifies the advancedness of the application of electrical equipment temperature control technology based on NSGA-Ⅱ algorithm through simulation analysis.

**Keywords:** Electrical Equipment, Temperature Control, NSGA-Ⅱ Algorithm, Technical Application.

# Blockchain-Based Searchable Asymmetric Encryption Scheme in Cloud Environment

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## Abstract

Searchable Symmetric Encryption is used in encrypted databases for precise queries. The most brutal attack has demonstrated that facilitating forward privacy is a critical security goal. Asymmetric searchable encryption enables searches carried out over ciphertexts via delegation and trapdoors by the data owner. Asymmetric Searchable Encryption introduces in this work for a blockchain-based keyword search system. It allows decentralized storage searches using an authorized keyword set. The ASE has based on a unique primitive that guarantees keyword authorization and searches. Explore the possibilities of Ethereum's smart contracts, the blockchain technology that provides a different pattern for reliability with effective processing. Locating encrypted cloud services was among the most frequent issues. This paper creates a novel public-key encryption that searches on the blockchain system that uses asymmetric key encryption to accomplish protected and well-organized keyword searches. The smart contract replaces the central search cloud server in AKE (Asymmetric Key Encryption), making it a searchable distributed public encryption scheme. It has a high search efficiency while reducing the number of computation-intensive operations.

**Keywords:** Asymmetric Encryption, Blockchain, Ethereum, Smart contract, Symmetric Encryption.

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# Improved YOLO X with Bilateral Attention for Small Object Detection

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## Abstract

Currently, general object detection networks exhibit low accuracy and instability in small object scenes. To address this issue, we propose an improved YOLO X algorithm for small object detection based on bilateral attention. This algorithm introduces a bilateral attention module that integrates attention feature maps from both spatial and channel dimensions, adaptively capturing refined features of the target object. This enriches the information of small objects on feature maps of different sizes and enhances communication of potential semantic information. Additionally, a relative position labeling strategy is used to enhance the accuracy of target location information and expand the detection range. Experimental results demonstrate that our method is more effective than the YOLO X model, particularly in handling small objects in remote sensing images, with a 1.1% improvement in mAP0.5.

**Keywords:** Small object detection, attention mechanism, Transformer.

**Paper ID
ICAISC 7979**

# An Optimal Detection System for Analog Circuits on Account of SA Algorithm

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## Abstract

The inherent properties of analog circuits make it difficult to detect faults in some situations, so many technologies involved have become the focus of academic discussion. Scholars use SA algorithm to improve the intrinsic properties of analog circuits, so as to promote the comprehensive function of analog circuits. By searching the full range of obstacles without blind corners, all problems can be identified and addressed. In the existing methods, for example, fault dictionary method, band verification method, etc., will encounter the interference of circuits or nonlinear factors. This paper studies the optimal detection system of analog circuit on account of SA algorithm, and explains the related content of the optimal detection of analog circuit. The test results show that the system on account of SA algorithm has high performance in analog circuit optimal detection.

**Keywords:** SA algorithm, analog circuit, optimal detection, detection system.

# Research on Auto Parts Resource Partner Selection Based on S2SH and GA

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## Abstract

In the case of increasingly fierce competition in the auto industry, every auto enterprise is required to launch more reliable products in a short period of time, in order to cater to and even lead the changing market. If auto parts manufacturing enterprises want to improve their competitiveness, they must have the advantages of quickly responding to market demand and providing services in time. Because there are many manufacturing resources of auto parts, among them, selecting the optimal resource that meets certain constraints is the ultimate goal of partner selection of auto parts manufacturing resources. Therefore, this paper studies the method of optimizing the partner selection of auto parts resources in the process of auto parts manufacturing, and combines the genetic algorithm optimization method with S2SH framework technology to better solve the coupling problem between the system module interfaces. on the basis of genetic algorithm and S2SH integrated framework technology, the partner selection model of auto parts resources is constructed, and the partner selection system of auto parts resources oriented to networked manufacturing is preliminarily realized. A concrete example is given in this paper, which proves that the partner selection system is feasible in theory. This study lays a foundation for how to effectively select auto parts resource partners in the networked manufacturing environment.

**Keywords:** S2SH Framework; Genetic Algorithm; Auto Parts; Selection of Partners.

# Prediction of High Skilled Talent Demand Network Model Based on Improved Ant Colony Classification Algorithm

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## Abstract

The network model for predicting the demand for highly skilled talents is a complex problem that can be solved using an improved ant colony classification algorithm. In order to solve the contradiction between the demand for highly skilled talents and the actual development of enterprises, this article applied an improved ant colony classification algorithm to the prediction of the demand network model for highly skilled talents, thus aiming to provide more talents for enterprises. This article applied experimental design and data comparison methods to analyze the demand system for highly skilled talents based on backpropagation neural network algorithm. The experimental data showed that the root mean square error predicted by the backpropagation model was 12.6. Compared to the grey prediction model, its effect was better.

**Keywords:** improved ant colony classification algorithm, highly skilled talents, talent demand, network model.

# Optimization of Logistics Network Structure Based on Single and Double Objective Dynamic Programming Model

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## Abstract

In recent years, with the development of new economy and electronic technology, the traditional platform economy can no longer meet the supply side and demand side demand of our country. In order to study the impact of the structure of logistics network on the actual transportation, this paper uses the single-objective decision-making method based on the pre-processed relevant logistics data under the background of diversified distribution modes of e-commerce logistics. Secondly, the dynamic programming model is established according to the actual situation. Finally, the number of reduced routes, cargo distribution scheme and line load balance and other aspects of the solution, finally completed the optimization of the logistics network, and evaluated the importance of different logistics sites, transport lines.

**Keywords:** logistics network, emergency dispatch optimization, neural network, single objective optimization, dijkstra algorithm.

# Optimization of Logistics Network Based on Single Objective Programming

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## Abstract

Logistics network is a system of transportation routes between logistics sites. With the rise of modern e-commerce, businesses increasingly rely on the efficiency and stability of large logistics networks. Therefore, optimizing the structure of logistics networks is crucial for improving transportation efficiency and responding to emergency situations. This article uses cargo volume data to develop two planning models related to transportation solutions in logistics networks to address emergency situations that arise from the closure of logistics sites. First, a single objective planning model minimizes the number of routes with changes in cargo volume, optimizing the use of available transportation routes. Second, a dual objective dynamic cargo volume allocation planning model achieves dynamic balance among each route, ensuring efficient use of transportation resources. This methodology optimizes the emergency structure of the logistics network, enabling a rapid response during emergencies, reducing transportation costs, and improving efficiency, and has high practical significance.

**Keywords:** Single objective planning model, dual objective dynamic cargo allocation planning model, optimization of logistics network emergency structure.

# Design and Technical Analysis of Simulation Environment Based on Ultraviolet Difference Algorithm

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## Abstract

The accurate quantitative analysis of two gases in the simulation of ultraviolet differential internal defects by decomposition products is directly related to SF. The existing simulation on-site detection technology is insufficient to solve the interference problem between gas components. Therefore, this article conducted relevant selection and design work to obtain a $SO_2$ and $H_2S$ mixed gas detection device based on UV differential absorption spectroscopy. Using differential simulation to extract the fast changing parts of SO and HS UV absorption spectra, the cross interference between $H_2S$ and $SO_2$ in the UV absorption spectrum region is removed through absorbance reduction and concentration inversion. The original spectrogram tested was digitally filtered, and the smooth waveform was obtained after denoising. Further FFT transformation and linear fitting were performed, and the Goodness of fit reached 0.999 9, which improved SF. Sensitivity of detecting mixed gases of $SO_2$ and $H_2S$ in background gas. When the system signal-to-noise ratio of the developed device is 1, $SO_2$ in the mixed gas ranges from 190 to 230 nm and from 280 to 320 nm. The detection limit of half bamboo section is 0.108 respectively μ L/L and 0.444 μ L/L, $H_2S$ detection limit is 0.490 at 190~230nm wave band μ L/L has laid the foundation for on-site testing applications.

**Keywords:** simulation, UV differential detection system, distributed, UV DOAS detection mechanism.

# MATLAB Simulation of Fresh Supply Chain based on Big Data and Internet +

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## Abstract

Big data and cloud computing technology can greatly improve the accuracy of decision making by improving the integrity of information obtained by retailers and suppliers, realizing the precise docking of supply and demand and scene realization at low cost and high efficiency, and realizing the consistent storage of fresh supply chain data and the traceability reliability of products. The application of these new technologies provides strong intellectual support for the modern and intelligent management of the fresh supply chain industry, and gives new impetus to the rapid development of intelligent logistics. In this paper, the basic model of single retailer and supplier is constructed. Stackelberg game analysis method is used to solve the model equilibrium solution in the case of cooperative decision. The influence of fresh-keeping effort and freshness degree on the optimal selling price and wholesale price under different conditions is discussed. Secondly, the pricing decision model under decentralized decision is constructed, and the equilibrium strategy of the model is solved and analyzed by the same method. After discussing the influence of preservation effort and freshness, the role of consumer price sensitivity coefficient under competition channels is further analyzed, and numerical verification is carried out.

**Keywords:** Big data, Internet +, fresh supply chain, MATLAB simulation.

# Design of Multimodal Information Evaluation System Based on Unsupervised Learning

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## Abstract

The 21st century is an era of rapid technological development, with increasingly intelligent and personalized means of transmitting, storing, and displaying information. Human communication methods, media, and modes are constantly changing. Human beings can no longer be satisfied with simply communicating information through language or writing, but rather hope to use multiple modes for information reception and transmission. This paper proposed a multimodal information analysis method based on unsupervised learning algorithm. First, it explained and defined the relevant theories of multimodal information and unsupervised learning, and then carried out experimental analysis. The experimental results showed that the efficiency level of multimodal information analysis based on unsupervised learning was higher than that of traditional multimodal information analysis.

**Keywords:** analysis system design, unsupervised learning, information analysis, multimodal.

# A Comprehensive Analysis on Trust Based Secure Routing Protocol used in Internet of Things (IoTs)

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## Abstract

Internet of Things (IoTs) is dynamic wireless network developed by utilizing the wireless nodes and that promises several benefits to the user. The important features of IoTs are less-cost infrastructure, scalability, stability and analytics that offers the opportunity to install it different applications like smart object as well as services interacting, environmental monitoring and even healthcare. Therefore, the security is an important factor to easy secured information transmission between mobile nodes in wireless medium. In this paper, important definition of secure routing protocol is designed with their benefits. Since, there are different types of secure routing is created for achieving secure transmission over IoTs. This paper studies various type of existing routing models like energy efficient secure routing, trust and cryptography-based routing utilized in IoTs. The packet drop ratio, consumption of energy and end to end delay are taken as a key parameter for determining secure routing protocols effectiveness. This comprehensive research the researchers to acquire better solutions for present problems in secure routing of IoTs.

**Keywords:** Secure routing protocol, malicious attacks, Internet of Things, energy consumption, packet drop ratio.

# Application of Simulated Annealing Algorithm in Emergency Logistics Optimization under 5G Network Environment

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## Abstract

With the continuous advancement of technology, "delivery vehicles + drones" has gradually become a new delivery method, especially for emergency material distribution in disaster-stricken areas. The main areas affected by disasters are served by delivery vehicles, while remote areas are assisted by drones. This method will greatly improve delivery efficiency and shorten delivery time. This article explores the overall delivery route of different transportation methods such as "delivery vehicles only," "delivery vehicles + drones," and "reduced delivery vehicles + drones" under different roadmaps using path planning models and simulated annealing algorithms. The complexity of the roadmap is gradually increased, and constraints such as increasing the maximum load and longest route are added to construct a planning model for the fastest delivery solution. The simulated annealing algorithm is used to provide the final route planning scheme, which provides theoretical guidance for actual delivery scenarios.

**Keywords:** Path planning, Dijkstra algorithm, Depth-first search, Simulated annealing, TOPSIS formatting.

# Robotic Attendance Scheme in the Classroom Using Artificial Intelligence and Internet of Things

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## Abstract

Facial recognition is one example of the ways in which computer vision is being applied in modern, people-oriented utility apps. Facial recognition technology has improved in recent years, but it still lags behind other biometric authentication methods such as fingerprint and iris scanning or Radio Frequency Identification (RFID) cards in terms of accuracy. However, it is still frequently utilised due to the fact that the recognition procedure does not involve touching the device in any way. This research takes advantage of advances in facial recognition technology to offer an embedded device integrated AI and IoT-based automated attendance solution for use in smart classrooms. This study uses the ResNet architecture to explore a deep learning classification method for identifying student attendance. In this research, we used facial photos from students to train ResNet-18 and ResNet-50. Models educated to differentiate regular from irregular student attendance. Our photos were evaluated on 20%, 25%, and 40% of simulated and real-world datasets, respectively. Results from three types of testing data show that ResNet-50 outperforms ResNet-18 in rapports of accuracy, F1-measure, and mean accuracy value. This study makes use of the FER2013 dataset for labelling faces, as well as real-time student faces. This study uses a deep learning approach to show how dependable and repeatable student image analysis.

**Keywords:** Radio Frequency Identification, Artificial Intelligence, Internet of Things, ResNet, Student Attendance.

# Automatic Push System for New Media Information Dissemination based on Neural Network Algorithm

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## Abstract

New media has become an indispensable and important tool in human life communication, information collection, and opinion dissemination, and has become an important way of information transmission. The article defines the definition of new media news release for the first time, and explains its characteristics and uses; secondly, it analyzes the method and process of information push in the new media environment, the historical traceability and advantages and disadvantages of each method, and finally constructs the new media information The basic model of push based on neural network algorithm has laid a theoretical foundation and basis for the subsequent research on the role of new media information push.In the calculation of personalized information selection, collaborative filtering recommendation algorithm is a relatively common algorithm currently used.

**Keywords:** neural network algorithm, new media information, automatic dissemination, automatic push.

# Transmission of ECG in Android Application by Cloud Server

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## Abstract

This paper proposes an approach for transmitting electrocardiographic (ECG) signals through a cloud server from an application named App1 to a remote application called App2. The objective is to enable real-time monitoring and analysis of ECG signals, facilitating remote healthcare services and enhancing the accessibility of medical data. The proposed approach leverages the capabilities of cloud computing and network connectivity to establish a seamless and secure communication channel between the two applications. The proposed approach has the potential to revolutionize remote healthcare services by enabling real-time transmission of ECG signals through a cloud server. It facilitates continuous monitoring of patients' cardiac activity, enhances collaboration between healthcare professionals, and expands the reach of healthcare services to remote areas. However, further research and development are required to address potential challenges such as network latency, data privacy concerns, and system scalability to accommodate a large number of users and data streams.

**Keywords:** ECG, Cardiac activity, Remote Sensing Technology, Healthcare services, Cloud Computing

# Incremental Benefits of Green Building Energy Efficiency Model Based on Apriori Algorithm

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## Abstract

China is a major energy consumer, accounting for 21.5% of the world's total energy consumption. Therefore, building an energy-saving society is an inevitable development direction. In the "13th Five Year Plan" development goals, China clearly proposed the "green" development concept, with addressing climate change, environmental change, and green sustainable development as the core for research. The construction industry is an industry with high energy consumption, consistent with the national development goals, and advocating "developing green buildings" has become a hot topic and inevitable trend. Previously, in the study of cost effectiveness of green buildings, attention has been paid to the research and application of relevant general specifications and standards, and corresponding green building technologies. More attention has been paid to cost effectiveness evaluation methods. Among the "four savings and one environmental protection" proposed by green buildings, the incremental cost of energy conservation accounted for approximately 47%. However, there are few studies on the direct economic benefits of energy conservation, especially the lack of direct economic accounting and analysis of the increased costs and benefits, making it difficult to fully demonstrate the economic feasibility of green buildings. Therefore, many relevant objects such as governments, developers, and consumers cannot have an objective and accurate understanding of green buildings, which to some extent hinders the development, utilization, and promotion of green buildings in China in the future. In the Apriori algorithm studied in this paper, the incremental efficiency of green building energy conservation has been significantly improved. The maximum increase in revenue per square meter was 24.98 yuan.

**Keywords:** green building energy conservation, incremental benefit demonstration, energy-saving solutions, Apriori correlation algorithm.

# Design of Accident Safety Risk System for Petrochemical Tank Farm in Port Area Based on N-gram Algorithm

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## Abstract

With the rapid development of the economy and the advancement of the industrialization process, the safety risks generated by the petrochemical industry in the development process are increasingly prominent. As a key link in the petrochemical production process, the safety accidents in the petrochemical storage tank farm often have extremely high harmfulness and complexity. In order to effectively prevent the occurrence of safety accidents in the storage tank farm, scientific and reasonable risk assessment and safety warning are required. Based on N-gram algorithm, this paper designed an accident safety risk system for petrochemical storage tank farms in port areas. The system has built an accident model by collecting and analyzing historical accident data, and used N-gram algorithm to train and optimize the model, thereby achieving functions such as accident prevention, early warning, and emergency handling.

**Keywords:** petrochemical storage tank, n-gram algorithm, accident safety risk, system design, prediction model.

# Identification of Sedimentary Microfacies Based on Genetic BP Algorithm and Image Processing

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## Abstract

With the development of The Times, the study of sedimentary microfacies is increasing. The study of sedimentary microfacies generally includes the division of sedimentary time unit in the study area, single well facies, well logging facies, well profile facies, plane facies, and finally the establishment of facies model. However, the current technology of sedimentary microfacies recognition is not perfect, so more excellent algorithms need to be added. This paper studies the identification of sedimentary microfacies based on gene-BP algorithm and image processing, aiming to better identify sedimentary microfacies through the two methods of gene-BP algorithm and image processing. In the experiment of this paper, the automatic identification coincidence rate of samples without screening is as low as 70% and as high as 75%, while the automatic identification coincidence rate of samples after screening is as low as 80%. The highest value is 88%. From this experimental result, it can be seen that the genetic BP algorithm is helpful for the identification of sedimentary microfacies.

**Keywords:** Sedimentary Microfacies, Genetic Algorithm, BP Algorithm, Image Processing.

**Paper ID**
**ICAISC 8778**

# Computer Network Security Protection System Based on Genetic Algorithm

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## Abstract

The complexity of network attacks and the vulnerability of computer network security protection system bring a lot of security risks to computer network security. In order to enrich the existing research on computer network security protection system, this paper discusses the means of computer network attack and intrusion, network security technology and genetic algorithm, and discusses the system development platform and network connection characteristics, designed various functional modules of the computer network security protection system, and Focused on designing an intrusion detection model based on genetic algorithm and its application deployment, And in the new cloud computing environment, a computer network security protection system based on genetic algorithms has been designed and deployed. Finally, the analysis is carried out through specific experiments. The results show that the computer network security protection system based on genetic algorithm has better defense effect than the conventional Internet Security Systems, and can provide more reliable and efficient security protection services in different security attack scenarios.

**Keywords:** genetic algorithm, computer network, security protection, intrusion detection.

**Paper ID**
**ICAISC 8796**

# Analysis of new embedded simulation technology based on Smart Internet of Things

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## Abstract

The integration of Intelligent Internet of Things (IoT) and Embedded Systems has made the design and development of embedded systems more intelligent and efficient. In embedded systems, simulation technology is an important tool that can be used to verify and test the correctness and reliability of the system. This article introduces a new embedded simulation technology based on the intelligent Internet of Things, which can be used to complete simulation testing more quickly, improve the accuracy and precision of simulation, and reduce the cost of system development and testing. The core of this technology is to utilize the data collection, transmission, and processing functions of the intelligent Internet of Things to input data from physical reality into the simulation system, achieving rapid construction of the simulation system and more accurate simulation results. At the same time, this technology also supports remote monitoring and control, enabling embedded systems to dynamically adjust and optimize during operation, improving system performance and reliability.

**Keywords:** Smart Internet of Things, New embedded simulation technology, Wisdom,

**Paper ID**
**ICAISC 8817**

# Measurement of Student Physical Fitness Based on Association Rule Algorithm

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## Abstract

In this paper, the body mass index data are firstly selected and transformed into Boolean data suitable for Apriori algorithm after data cleaning, data reduction and data transformation according to the characteristics of limited and consistent length of college students' body measurement data. Then, the operation efficiency of the Apriori association rule mining model is improved jointly from the perspective of transaction compression hash technology. Finally, strong association rules between indicators are screened based on the support and confidence framework. The experiment result shows that: The Apriori algorithm based on transaction compression and hash proposed in this paper is more efficient. Compared with the classical Apriori algorithm, the implementation efficiency of the body measurement data algorithm for girls is improved by 86.12%, and that for boys is improved by 92.65%;Compared with Apriori algorithm based on transaction compression, the performance efficiency of the female body measurement data algorithm is improved by 80.57%, female body by 89.32%;Compared with the Apriori algorithm based on hash, the implementation efficiency of the body measurement data algorithm is improved by 48.1% for girls and 55.69% for boys. Result finding that the model can obtain effective correlation information between body mass indexes and improve the operation efficiency significantly, it can be applied to physical fitness test practice.

**Keywords:** Association rule mining, Apriori algorithm, Transaction compression, Hash technology, Physical measurement.

# A Joint Algorithm of SBM-DDF and Global Malmquist Luenberger Index for Green Total Factor Productivity of Urban Industry Based on Matlab

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## Abstract

The Pearl River Delta region(PRD) is one of the most open-minded and active regional economic centers in mainland China, and also has an important position in the world economic map. This paper incorporates energy inputs and unexpected outputs into the analytical framework of total factor productivity, constructs the SBM-DDF model, and collects balanced panel annual data from 2010-2019 for nine cities in the PRD region, and measures the SBM-based efficiency values. It was found that the industrial green total factor productivity in the PRD showed a sharp decline and a rapid rise similar to a large "V" pattern. From the city's perspective, the industrial green total factor productivity in Zhaoqing, Zhuhai, Zhongshan, Jiangmen, and Shenzhen was higher, while that in Dongguan, Huizhou, Foshan, and Guangzhou was lower. Based on the SBM efficiency value, the GML index was calculated and decomposed into technical efficiency progress and technical progress. It is found that the change of GML index reflecting green total factor productivity is mainly driven by technological progress, which reveals that science and technology is the most important driver of total factor productivity improvement, and it is essential to take the path of scientific and technological innovation for high-quality economic development.

**Keywords:** pearl river delta, green total factor productivity, SBM efficiency, DDF, GML index, technological progress.

# Localization Recommendation Algorithm of Online Translation Course Based on Deep Neural Network

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## Abstract

With the rapid development of Internet technology, more and more people begin to use the Internet for learning. However, the diversity and complexity of online course resources make it difficult for people to find high-quality educational resources that meet their own needs. Online translation courses, with the advantages of large capacity of knowledge and information, rich content, strong interactivity, and high degree of personalization, are an important and indispensable educational resource in the field of online learning. After studying a large number of domestic and foreign literatures, it is found that on the basis of studying the existing online translation courses, this paper uses deep neural network to conduct localization recommendation research on them. The research results show that under the same conditions, the number of qualified and unqualified students before optimization is 25, but the number of students with 60-69 scores accounts for the most, and there are no students with 90 scores and above. After optimization, the number of qualified students has become 47, and the number of students with 70-79 scores accounts for the most, and the number of students with 90 scores and above has also increased significantly. The number of unqualified students is 3, accounting for 6%, It shows that the deep neural network is conducive to the development of online translation course localization recommendation algorithm, and points out a new direction for the optimization of online translation course localization.

**Keywords:** online translation, deep neural network, course localization, recommended algorithm.

# Automatic Machine Translation System for Artificial Intelligence based on Parallel Corpus

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## Abstract

Machine translation has evolved rapidly along with the development of statistics and linguistics. The acquisition of machine translation knowledge is based on the existing language, corpus and machine learning methods, from which knowledge is extracted to improve the translation effect. The aim of this article is to study artificial intelligence machine automatic translation systems based on parallel corpora. The article describes the process of building a multilingual-based parallel corpus and gives a CAT software package. The weighting of this feature is obtained by defining the evaluation features of multiple parallel corpora and combining each evaluation feature using a linear model using the Perceptron algorithm. By analysing the coverage contribution factors and quality assessment features of the packets, a subset of data suitable for statistical machine translation is proposed, and the decoding cost of the system is reduced to some extent.

**Keywords:** parallel corpus, artificial intelligence, automatic machine translation, translation system.

# Intelligent Algorithm of Tourist Attraction Recommendation Based on Big Data

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## Abstract

Technological reform and innovation will promote the development and construction of tourism, and provide us with more convenient service experience. With information overload, we need new methods to provide better services for users. Personalized recommendation is one of the key directions of smart tourism research. The purpose of this paper is to study the intelligent algorithm of tourist attraction recommendation based on big data. By calculating the heat vector of scenic spots and adding the time context, the BIPM personalized recommendation algorithm proposed in this paper is adopted to recommend scenic spots for users. The recommendation model is verified and analyzed by using the data set captured from the tourism website platform. The results show that the proposed BIPM algorithm is superior to the collaborative filtering algorithm.

**Keywords:** big data technology, tourist attractions, recommendation intelligence, intelligent algorithm.

# Research on Emergency Transportation and Structural Optimization of E-commerce Logistics Network for Goods Volume Prediction and Optimal Scheduling

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## Abstract

This paper explores how to reduce costs and improve efficiency by predicting the package volume at various logistics sites and railways, and arranging transportation and sorting plans in advance. We have established prediction models, optimization models, evaluation models, and conducted in-depth research on emergency transportation and network optimization. The main work of this paper is divided into four aspects. Firstly, data cleaning and prediction using ARIMA and LSTM models; secondly, constructing a cargo distribution optimization model based on the DC5 diversion ratio and solving it using simulated annealing algorithm; thirdly, constructing a flow plan planning model based on three-objective dynamic decision-making and solving it using simulated annealing algorithm. Fourthly, the indicators for evaluating the impact of routes include the number of transported packages, transportation frequency, maximum transportation volume, and transportation balance; for site influence factors, we choose the total amount of goods sent and the number of goods received by the site. We have built a comprehensive evaluation model for site routes based on entropy weight Topsis and conducted five comparative experiments to verify the robustness of the model.

**Keywords:** ARIMA-LSTM, linear programming, simulated annealing algorithm, multi-objective programming.

# Design of Human Motion Training Motion Capture Model Based on Improved PSO Algorithm

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## Abstract

Sports training is an effective way to improve athletes' performance and psychological quality. Various computer hardware and software systems have been greatly improved, which provides technical support for sports training. In order to effectively reduce the loss caused by athletes' wrong actions and improve their hit rate, this paper explores the human motion training motion capture model based on improved PSO algorithm. In this paper, the auxiliary training system of improved PSO algorithm and human motion capture model is studied by means of experimental comparison and algorithm comparison. Experimental data show that the number of iterations of the improved PSO algorithm is mostly less than 200. In this paper, the improved PSO algorithm can reasonably meet the needs of motion capture auxiliary model.

**Keywords:** improved PSO algorithm, human motion, training action, capture model.

# Investigation on Multi-objective Optimization of Construction Engineering Based on Data Mining Association Rule Algorithm

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## Abstract

In recent years, with the rapid development of computer technology, people have put forward higher requirements for data mining tools and methods. This paper mainly studied multi-objective optimization problems in the field of construction engineering. By establishing models, information such as building structures and buildings was modeled and processed, and influencing factors were analyzed and predicted. After being quantified, the examples were used to illustrate the application effect, and the model was optimized. The test results showed that the data processing efficiency of the multi-objective optimization model for construction engineering based on the data mining association rule algorithm was around 74% to 77% before optimization, and the data processing efficiency after optimization was between 80% to 90%. At the same time, appropriate index parameter values were selected based on the actual situation to maximize the synergy between engineering projects and optimize economic benefits, thereby achieving the goal of improving construction efficiency and quality.

**Keywords:** big data, data mining association rules, construction engineering, multi-objective optimization.

# Research on Formation Flight Adjustment of UAVs based on Passive Localization

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## Abstract

Unmanned aerial vehicle (UAV) passive localization has grown in popularity as a research area due to the increasing prevalence of contemporary electromagnetic interference. In this study, a polar coordinate system mathematical model based on the sine theorem and analytic geometry is built in accordance with the direction information that the UAV deduced from the signal it received. The bare minimum of transmitting signal UAVs is chosen using an optimization algorithm and statistical indicators. Additionally, this study proposes a dynamic programming model based on an iterative algorithm and introduces the objective function in a novel way by making it the sum of the absolute values of positive and negative angle deviations. The experimental findings demonstrate that the UAVs can reach the target position in only 16 iterations, demonstrating the algorithm's dependability.

**Keywords:** UAV positioning, Newton-Raphson algorithm, dynamic programming, PSO.

**Paper ID**
**ICAISC 9559**

**Emergency Transportation and Structural Prediction and Optimization of Goods Based on ARIMA and Multi-objective E-commerce Logistics Network Model**

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## Abstract

With the development of the internet, online shopping has gradually become a popular way of shopping among the general public, which in turn poses a greater challenge to the e-commerce logistics network. Predicting the volume of goods for each logistics site and route, and establishing a model for quickly adjusting the network in response to sudden situations can save logistics network costs and improve its efficiency. Therefore, this article has done the following work: first, it establishes an effective logistics network volume prediction model; second, for the two scenarios of network structure that cannot be modified and can be modified, it provides a model that can effectively guide the adjustment of the volume of goods on each route when a logistics site is closed; finally, it establishes a logistics network evaluation model to evaluate the importance of logistics sites and routes.

**Keywords:** Logistics network, emergency transportation optimization, ARIMA model, multi-objective optimization, particle swarm algorithm.

**Paper ID**
**ICAISC 9670**

**Application of Computer Security Management in Internet Finance**

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## Abstract

Internet finance is based on more advanced and mature computer security management technology. On the way of its development, it should continue to strengthen the optimization and upgrading of computer security, improve the quality of financial services, reduce the cost of financial services, avoid the risks of financial services, and further expand the scope of Internet finance services. This paper preliminarily explores the application of computer security technology in the network system, plays a certain reference role in the development of computer security management technology in the network, analyzes some problems in the current financial technology risks, and then discusses the role of computer security management in the interconnected finance. The research will help us to better prevent the risks of financial technology, and the exhibition is for reference. According to the data, it can be seen that when the equivalent reaches 0.2, the risk reaches 0.4, 0.6.0.8 respectively, and when the maximum value reaches 0.8, the risk value is 0.2, 0.3 and 0.8 respectively, which shows that there is still a great risk in Internet finance.

**Keywords:** Internet financial management, financial analysis, financial risk, computer security management.

# Key Technologies of Mobile Application of Marketing Business Based on Universal Network

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## Abstract

With the continuous development of mobile terminals and wireless communication technology, the equipment of the existing office automation information system of marketing enterprises may not be able to meet the needs of system development - this is an urgent problem to be solved. At the same time, with the continuous development of smart terminals, mobile smart terminals are developing in the direction of multiculturalism. In order to attract more customers, many terminal manufacturers choose different operating systems and adapt special functions for their operating systems. The main purpose of this paper is to research the key technologies of mobile application (MA) in marketing business based on general network. This paper adopts the test model combined with the actual software situation of the mobile trading platform, and carries out various test steps in the mobile trading platform. According to the detailed analysis of the platform test results, the final analysis shows that the test success rate of the mobile trading platform exceeds the set upper limit, there are no major problems, and it meets the initial and test performance requirements of the program.

**Keywords:** general web, marketing business, mobile apps, mobile marketing.

# The Evaluation Model of University Education Level Based on Deep Learning Algorithms

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## Abstract

Evaluation is an important means to promote the development of college education. At present, scholars have carried out research on college education and have also proposed some evaluation indicators for college education. The purpose of this article is to study the educational level evaluation model based on deep learning algorithms. First, based on deep learning, the AGA-BP model is proposed, which outlines the concept of education level, builds an evaluation index system with output and input resources, and designs corresponding questionnaires to establish a university education level evaluation model based on deep learning algorithms. Taking Province M as an example, this model can provide powerful tool support for the practice of evaluating the educational level. The experimental results show that the lowest scoring higher education efficiency score reached 1.2 in 2018, and higher quality output can be obtained through reasonable adjustment of higher education input. Evaluation practice provides guidance and suggestions for the development of higher education level, and provides decision-making support for higher education.

**Keywords:** Deep Learning, Education Level, Evaluation Model, Improved Algorithm.

# A Software Defined Network (SDN) architecture is used to protect against Slow HTTP DoS attacks

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## Abstract

In this digital era, all the information are stored and accessed digitally by large scale of users across the world. Where there is confidential information, there lies the threat as well. Analogous to this, several digital security threats have evolved drastically in the past years. Researchers have proposed many mitigation methods to overcome such hazards. However, there are some drawbacks along with those methods in terms variety of performance metrics. In this project, we have proposed a solution for such security threats that occur in Software Defined Network (SDN) environment. Our proposed work has completely removed the presence of attack from the system. We implemented 4 different scenarios to illustrate the working efficiency of our system. The first one is SDN architecture with no attack, the second one is SDN architecture with slow HTTP DoS attack, the third one is proposed SDSec architecture with no attack and the final one is proposed SDSec architecture with slow HTTP DoS attack. Each of these scenarios is implemented as well as explained in detail. Finally, the performance of the system is analyzed in terms of throughput, delay and packet delivery ratio. The experimental observation stands for the novelty and efficiency of the proposed system.

**Keywords:** DDoS Attack, Deep Learning, SDN.

## About the Institution

Shri Dharmasthala Manjunatheshwara Educational [SDME] Society, Ujire® was established with the primary objective of making education accessible and affordable to rural youth under the guidance of Dharmaadhikari, Reformer, Educationist, Philosopher and Philanthropist, Poojya Padmavibhushana Dr. D. Veerendra Heggade. As the President of the SDME Society, he is the guiding spirit and driving force for the institution. With the hallmarked vision of inculcating Value into Education, at present, it manages 56 educational institutions from Kindergarten to Doctoral Studies in the state of Karnataka in India. The institutions offer quality education in the fields of General, Law, Technical, Medical and Management Studies. These institutions ensure quality through updated skill sets and value based education.

The SDME Society Trust Office is located at Ujire, which acts as the central functioning unit for all management actions for SDM Institutions. Dr. Satheeshchandra, Secretary Ujire and Shri Jeevandhar Kumar, Secretary Dharwad under whose guidance the institutions have been functioning with renewed efficiency.

Shri Dharmasthala Manjunatheshwara College of Engineering & Technology, Dharwad offers 8 Undergraduate Programmes SDMCET has 7 M.Tech/MBA programs and 11 research centres across the college and a total of 154 research scholars working under more than 80 research guides at present. SDMCET has 25 funded research projects granted by funding agencies such as DRDO, ISRO, AICTE, DST, VGST, VTU, etc and 06 have been completed and 19 are on-going with a total sanction of more than 4.5 crores. Thus, the faculty members promote and deeply involved in research and consultancy in their respective discipline as well as interdisciplinary domains. This activity in the Institute brings up its intellectual base.

## About The Conference

International Conference on Applied Intelligence and Sustainable Computing (ICAISC-2023) is intended to provide a common platform to the Research Scholars, Academicians, Scientists, Industrial Practitioners and Engineers in frontline evolutionary and challenging fields. ICAISC–2023 will act as a premier forum for researchers and practitioners interested in advances and applications of Information Engineering, Image Processing and Communication Systems. It is an opportunity to resent and observe the latest research trends and ideas in these areas. ICAISC-2023 aims to strengthen relationships between Industries, Organizations and Institutions.

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