"To the Glory of God"

International Conference on Artificial Intelligence, Cybersecurity & Mathematical Modelling (AICMM 2023)

October 27 - 29, 2023

Organized by

Departments of Mathematics, Computer Science and Applications
Loyola College of Arts & Science (Co-ed.)
Mettala, Rasipuram Taluk, Namakkal District

in collaboration with

Department of Computing Science
Periyar University, Salem District
Tamil Nadu, India

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Mettala, Oilpatty Post, Rasipuram Taluk, Namakkal District
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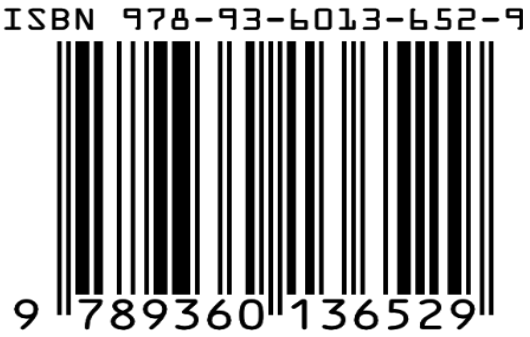

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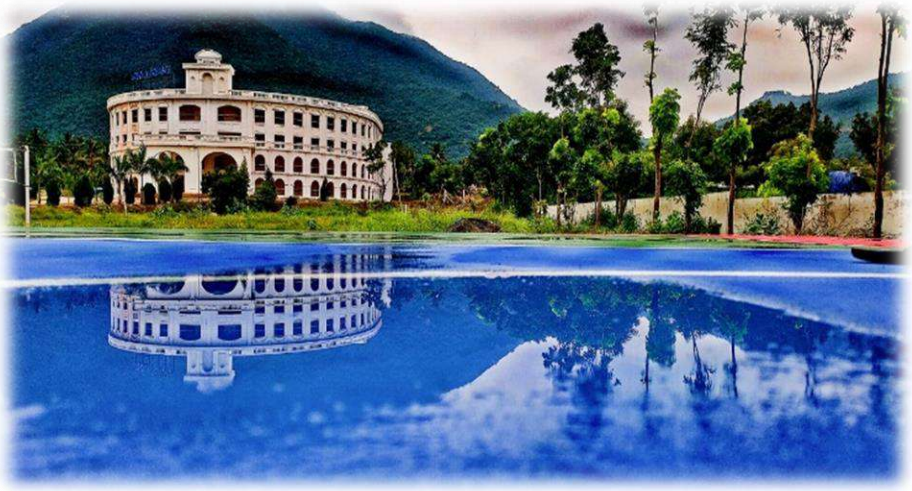

About Loyola College:

Loyola College, Mettala, is a minority Catholic Co-Educational Institution, Affiliated to the Periyar University, Salem. The College obtained 2(f) status from the University Grants Commission, New Delhi. It is one among the six colleges, run by the Chennai Province of the Society of Jesus. All these institutions under the chairmanship of the Provincial of the Jesuit Chennai Province follow a common policy for admissions, appointments and administration. As a minority Institution, the college caters primarily to the formation of Catholic students. However, our college keeps its portals open to any student without discrimination of caste and creed. The college Emblem with the motto & quot; Let your light shine& quot; brings lights of hope and liberation to others.

About Periyar University:

The Government of Tamil Nadu established Periyar University in Salem on 17th September 1997 as per the provisions of the Periyar University Act, 1997. The University covers the area comprising four districts namely Salem, Namakkal, Dharmapuri, and Krishnagiri. The University obtained 12(B) and 2(f) status from the University Grants Commission, New Delhi and it was reaccredited by the NAAC with "A++" Grade in 2021. The University had secured 59th rank among Indian Universities by MoE - NIRF 2023.

About Conference:

The Artificial Intelligence, Cybersecurity and Mathematical Modelling (AICMM 2023) seeks to provide a forum for researchers interested in mathematical applications in computing sciences. At this conference, research scholars and scientists will provide a new source of interesting and innovative IDEAS in the analysis of models for computing sciences. Using existing tools to analyse algorithms and data structures, on the other hand, will result in significant advancements. By organizing the conference, we hope to make further progress towards establishing a regular meeting place for discussion of topics in the fascinating domain of Mathematics and Computing Sciences. We are excited to create new techniques for managing the massive amount of mathematical and computing knowledge made available by new information technology developments.

பெரியார் பல்கலைக்கழகம்
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NAAC A++ Grade - State University - NIRF Rank 73 - ARIIA Rank 10
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Professor **R. Jagannathan**
Vice Chancellor

Date: 28-11-2023

Message

I am truly delighted to write this greeting in the way as Vice-Chancellor of Periyar University. The Departments of Mathematics, Computer Science, and Applications of Loyola College of Arts and Science, Mettala, in collaboration with the Department of Computer Science at Periyar University, kindly extend a warm invitation to all of you to attend the International Conference on "Artificial Intelligence, Cybersecurity & Mathematical Modelling (AICMM 2023)". One of the expanding connected institutions has been granted a fantastic opportunity by the university department, demonstrating a kind of magnanimous attitude.

I passionately felt that future research collaborations and quality would both benefit from this international conference. Research is essential to the nation's progress. Research institutions, which include universities and colleges both domestically and abroad, ought to launch and carry out further research projects in order to address global issues and provide solutions. Critical discussion of the research studies' findings is required, and appropriate actions must be adopted in light of the persuasive arguments. The academic scholars from different parts of the state have contributed contributions to this conference. I can state with confidence that the AICMM 2023 provides the finest forum for critically discussing research findings and developing workable answers to the problems facing the globe today.

This conference's main goal is to give researchers who are interested in mathematical applications in computer science a forum. These days, having knowledge of artificial intelligence and cyber security is crucial. Undergraduate students and research experts will gain insights into these hot subjects of the day through this conference. Even if the world is changing, it is the duty of the accomplished student to improve human life standards while also safeguarding them for future generations. There should be a critical discussion of this issue as well.

Furthermore, I would like to express my gratitude to the participants, sponsors, reviewers, and noteworthy keynote speakers. I also would like to acknowledge the conference organizing committee and all of the staff members of the Periyar University Department of Computing Science, the Loyola College of Arts and Science Department of Mathematics, Computer Science and Applications of Mettala for effectively organizing this international conference.

28.11.23

[R. Jagannathan]

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Secretary's Message

"If you dream it, you can achieve it!"

It is with great pleasure and enthusiasm that I extend my warmest welcome to you all to the International Conference on "Artificial Intelligence, Cybersecurity & Mathematical Modelling (AICMM 2023)". As the Secretary of this esteemed event, I am honored to preside over the dissemination of knowledge and insights generated during our conference.

The AICMM Proceedings serve as a comprehensive repository of the groundbreaking research, innovative ideas, and thought-provoking discussions that have transpired over the course of our event. Within these proceedings lie the collective wisdom of scholars, researchers, practitioners, and policymakers who have come together to address the most pressing challenges facing our world today

I am immensely proud of the breadth and depth of contributions included in these proceedings, covering a wide range of topics spanning various disciplines and sectors. From cutting-edge scientific research to innovative technological advancements, from insightful policy analyses to inspiring case studies, the diversity of perspectives showcased here reflects the richness of our global intellectual community.

As we embark on this journey of exploration and discovery through the pages of the AICMM Proceedings, I encourage you to immerse yourselves in the wealth of knowledge and insights contained herein. May these proceedings serve as a source of inspiration, innovation, and collaboration for all who engage with them.

Once again, I extend my warmest welcome and heartfelt thanks to all who have contributed to the success of the International Conference on "Artificial Intelligence, Cybersecurity & Mathematical Modelling (AICMM 2023)". May your contributions continue to make a meaningful impact on the advancement of scholarship and the betterment of society.

Rev. Dr. Albert William, SJ.
Secretary

Principal's Message

"The function of education is to teach one to think intensively and to think critically.
Intelligence plus character that is the goal of true education".
-Martin Luther King, Jr.

It gives me an immense pleasure to contribute a message to the proceedings of the International Conference on "Artificial Intelligence, Cybersecurity & Mathematical Modelling (AICMM 2023)" organised by Departments of Mathematics, Computer Science and Applications of Loyola College of Arts and Science, Mettala in Collaboration with Department of Computing Science of Periyar University, Salem.

The 21st century world is evolving more quickly than before. Teachers face a problem in adapting to the shifting global landscape while preparing their students for the future. It is important to teach kids how to think, not what to think. Students can learn more about the burgeoning topics of artificial intelligence, cybersecurity, and mathematical modelling by attending this international conference. This conference is a step toward realizing our goal of developing into a premier academic and research organization that generates human capital with a first-class mindset.

A large conference of this magnitude cannot be planned without the unwavering dedication and participation of numerous individuals, including sponsors, students, and faculty. I commend them for their dedication and wish them well on the conference's success. I also want to express my sincere gratitude to all of the sponsors for their kind efforts in supporting scholarly research.

Furthermore, I want to emphasize that in this age of rapid technological improvement, collaboration among researchers is essential to our survival; we cannot succeed if we do not support and enhance one another's work. I think that this conference and its proceedings would be a terrific way for academic staff, researchers, and engineers to collaborate, network, and learn. It would also foster an atmosphere that would be very beneficial to all parties involved in intellectual exchanges.

At last, I would want to express my gratitude to the participants, sponsors, reviewers, and notable keynote speakers. I also extend my congratulations to the conference organizing committee and all the staff members of Loyola College of Arts and Science, Mettala and Department of Computing Science of Periyar University, Salem for their successful organization of an international conference.

Rev. Dr. Samuel Jeyaseelan, S.J.
Principal/Patron

Convener's Message

Our goal is to create an environment that encourages intellectual stimulation and the sharing of knowledge. The fusion of artificial intelligence, the fortification of cyber security, and the precision of mathematical modelling can empower us to find innovative solutions to pressing global issues.

This conference promises to be a platform for the exchange of innovative ideas, the latest research findings, and collaborative discussions among experts in Artificial Intelligence, Cyber security &Mathematical Modelling. With delegates and presenters from across the globe, we are confident that this event will foster invaluable networking and learning opportunities. It will foster invaluable connections, enlightening discussions, and the inspiration to push the boundaries of these three interconnected fields. We hope this conference not only broadens your horizons but also leads to tangible contributions that will shape the future of AI, Cyber security, and Mathematical Modelling. As we embark on this journey of exploration, collaboration, and discovery, I am excited about the potential breakthroughs and insights that will emerge from AICMM 2023. I look forward to the positive impact that your contributions will have on our global community.

I would like to express my sincere gratitude to the organizing committee, the sponsors, partners, and all those who have dedicated their time and expertise to make this event possible. Your dedication and hard work have been instrumental in ensuring the success of AICMM 2023. And my special thanks to the Department of Computing Science of Periyar University, because it's a great privilege for us to get this opportunity and we made it possible because of your tireless efforts.

Dr. D. Arul Pon Daniel
Convenor, AICMM 2023/
Coordinator, IQAC

THE EDITORIAL MESSAGE

Dear Readers,

'When the winds of change blow, some people build walls, and other build windmills.'
- an Ancient Chinese proverb

On behalf of the Editorial board, it is with great pride and privilege that I am writing this message to this great intellectual collection of research papers. We equip with many talents and bubble with many new innovative ideas, but always there's need of correct platform to showcase all our talents.

An apt platform will show you the right path and serve as bridge between the researcher and the intellectual world. Through this magazine, you can get ample number of visionary writings on highly updated topics on current scenario. We hope that this magazine helps the integrated team to achieve the goal of generating evidence-based research to address the current vibrant issues and ideas.

This conference unites together the academicians, research scholars, subject experts and students to contribute their knowledge of existing areas and the ones yet to be explored. We believe that you all benefit out of these research papers and case studies that have been worked upon passionately.

We thank all the authors for their strenuous contribution. Our heartfelt and sincere gratitude to our Jesuit Management, Conference Advisory Committee, Organising Committee and Editorial team for their support and guidance.

Ms. B. Catherine Pradeepa &
Ms. R. Janani Iswariya
Editors - AICMM 2023

PREFACE

It is with immense pleasure and a sense of scholarly camaraderie that we present to you the proceedings of the International Conference on Artificial Intelligence, Cybersecurity & Mathematical Modelling. This volume represents the culmination of the collaborative efforts of scholars, researchers, and experts who converged from around the world to explore the fascinating intersections of these pivotal disciplines.

In an era defined by digital transformation and technological advancement, the amalgamation of artificial intelligence, cybersecurity, and mathematical modeling has emerged as a driving force, reshaping industries, societies, and the very fabric of our interconnected world. This conference stands as a beacon of intellectual exchange, a platform where innovative ideas are shared, knowledge is disseminated, and lasting connections are forged.

Artificial Intelligence, the vanguard of this transformation, continues to make profound inroads into every facet of our lives. Within these proceedings, you will encounter a diverse array of research papers and contributions that illuminate the multifaceted dimensions of AI. From cutting-edge machine learning algorithms to ethical considerations in AI deployment, these papers showcase the breadth and depth of AI's impact on our evolving world.

Simultaneously, the domain of Cybersecurity has never been more crucial. With the exponential growth of digital connectivity, the stakes have risen, and the challenges have become increasingly complex. The contents of this volume delve into innovative cybersecurity strategies, threat analysis, risk mitigation, and the imperative of protecting our digital landscapes from evolving threats.

Furthermore, Mathematical Modeling, a timeless tool of inquiry and discovery, continues to provide the analytical framework for understanding and solving real-world challenges. The mathematical models presented within these pages offer elegant solutions to a wide array of problems, from environmental sustainability to data analytics, underscoring the enduring relevance of mathematics in our technologically-driven world.

The richness of these proceedings is a testament to the collaborative ethos of our conference. We extend our heartfelt appreciation to all the authors who have contributed their groundbreaking research, the diligent members of our organizing committee, and the generous support of our sponsors. It is your dedication and enthusiasm that have made this conference and its proceedings possible.

As we immerse ourselves in the contents of this volume, may it serve as a wellspring of inspiration, a source of knowledge, and a catalyst for future research endeavors. Let these proceedings be a reflection of our shared commitment to advancing the frontiers of Artificial Intelligence, Cybersecurity, and Mathematical Modelling for the betterment of our global community.

Thank you for joining us on this remarkable intellectual journey.

Faculty Members & Students,
Department of Mathematics, Computer Science and Applications,
Loyola College of Arts & Science, Mettala.

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Revolutionizing Human Disease Detection: Advancements and Insights from Machine Learning Algorithms

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ABSTRACT - The breakthrough developments in Machine Learning (ML) algorithms have dramatically changed the field of human disease diagnosis in recent years. DTs, RFs, and Naive Bayes have the potential to revolutionise the diagnosis of human diseases. This work intends to explore this potential and offer insightful information about how it might be used. The study starts off by giving a summary of ML algorithms and how they apply to the diagnosis of diseases.

In addition to identifying each algorithm's distinctive qualities and applicability for various illness detection scenarios, the research looks at the strengths and weaknesses of each one. Additionally, it examines the effects of several elements, like dataset size, feature selection, and model optimisation methods, on the effectiveness of these algorithms. Furthermore, DTs, RFs, and Naive Bayes have all been used in recent research and practical applications for detecting human diseases. The successful application of these algorithms in several medical fields, including cardiology, oncology, and neurology, is demonstrated through case studies.

The results show that while RF delivers resilience and enhanced accuracy through ensemble learning, DTs excel in creating models that are transparent and understandable. While handling huge datasets, Naive Bayes exhibits efficiency and scalability. For clinical practise, patient care, and healthcare systems, the effects of these developments in ML algorithms are examined. The report also emphasises the difficulties and potential paths for future research in applying these algorithms, such as addressing data privacy issues, managing unbalanced datasets, and incorporating them into current healthcare infrastructure.

In conclusion, this study highlights the crucial contributions of various ML algorithms to the field of human illness detection. This work contributes to ongoing initiatives to improve disease diagnosis and prognosis and, ultimately, patient outcomes by putting light on their developments and offering insights into their implementation.

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Data Pre-processing Technique and Exploratory Data Analysis (EDA) For Covid -19 in India using Machine Learning

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ABSTRACT - In any research analysis, EDA is a crucial step. The goal of EDA is to recognize the dispersion of data, outliers, and anomalies in order to identify a special condition for your research question. Additionally, by regularly using graphical representations to visualize and comprehend data, it suggests tools for generation of hypothesis. After collecting the data and completing the preprocessing step, the first early phase in data analysis (EDA) involves thoroughly visualizing, plotting, and manipulating the data without taking decision to evaluate the quality of the data after that to develop models. Most of the researchers used EDA techniques, with a few remarkable exceptions, are graphical in nature. The main purpose of EDA is to identify the survey, which by definition necessitates that the analysts have unparalleled control over the data while performing that operation, which is why there is such an excessive dependence on visuals.

IoT Voice Based Command Execution and Speech Recognition Systems

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ABSTRACT - In this paper, an affordable and effective voice recognition-based control system is proposed for the elderly and disabled individuals. The objective is to develop a low-cost speech recognition system that enables easy access to devices installed in smart homes and hospitals, without relying on a centralized Internet of Things (IoT) management system. The study presents a multifunctional voice-controlled smart home system that employs ESP-32 as the wireless option. A specialized hardware component is responsible for recognizing voice commands, and the natural language input is transmitted to the database. It examines the data from the database on the recognition unit, interprets the instructions spoken by the user, and controls the devices of the household.

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Voice Based Intelligent Web-browser and Virtual Assistance for Visually Impaired

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ABSTRACT - This abstract introduces a voice-based intelligent web browser and virtual assistant designed specifically to assist individuals with visual impairments. The system leverages advanced technologies in speech recognition, natural language processing, and web browsing to provide a seamless and inclusive browsing experience for visually impaired users. The voice-based intelligent web browser acts as a gateway for visually impaired users to access and navigate the internet using voice commands.

Additionally, the virtual assistant component enhances the browsing experience by providing contextual information and personalized assistance. It utilizes machine learning algorithms to adapt to individual user preferences, learning their browsing habits and providing tailored recommendations. The virtual assistant can read out web-page content, provide audio descriptions for images, and offer suggestions based on the user's browsing history and interests.

The system's accessibility features extend beyond web browsing, enabling visually impaired users to interact with their devices through voice commands. Users can initiate phone calls, send messages, set reminders, and perform other tasks using natural language voice prompts. The system aims to enhance the independence and productivity of visually impaired individuals, allowing them to access information and perform online activities with ease.

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Development of an Artificial Intelligence Based Breast Cancer (BC) Prediction in Health Care System

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ABSTRACT - Artificial Intelligence (AI) helps to identify and detect the image of breast masses, segment breast masses, determine breast density, and determine cancer risk. One of the most crucial stages in computer-aided diagnosis is the detection of breast masses since they are a frequent finding in BC patients. According to cancer statistics, BC is presently the most prevalent kind of cancer among women globally. It is one of the most common causes of mortality in women and grows in the breast tissue.

The second most common cause of mortality worldwide and one of the worst diseases is BC. If this cancer is discovered when it is in its early stages, it may be cured. 93% or more of BC patients survive if the disease is discovered early. BC may be categorized in a variety of ways and has many different subtypes. It's simple to get perplexed. A type of BC is when certain cells in the breast become cancerous. Patients with BC may develop malignant or benign tumors. Malignant tumors are risky due to their more rapid development than benign ones. In order to treat a patient with BC effectively, early tumor type identification is crucial. The major goals of this chapter are to describe the dataset and assess how effectively various machine learning techniques predict BC. To categories tumors into benign and malignant types, Support Vector Machine (SVM), Logistic Regression (LR), K-Nearest Neighbors (KNN), Decision Tree (DT), Naive Bayes (NB), and Random Forest (RF) classifiers have been used. In this chapter, the optimum algorithm is determined by calculating and comparing the accuracy of each method.

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Ethical and Security Considerations for Quantum Computing Management

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ABSTRACT - A new age of computation has begun as a result of the quick development of quantum computing technology, which promises revolutionary powers and processing power never before seen. However, this quantum revolution also brings with it fresh difficulties and dangers, notably in the areas of security and ethics. These important topics are addressed in this qualitative research study by looking at the security and ethical difficulties that come up while managing quantum computing systems. This study will examine and comprehend the ethical conundrums and security risks brought on by quantum computing. With this, we may discover risk-reduction strategies and ideas for safe, moral quantum management. For data security, the emergence of weaknesses in traditional encryption is concerning. A new technology's potential for abuse is a concern, as is ensuring that everyone has access to it. By examining recent research, case studies, and expert interviews, we'll take a qualitative approach to gain an understanding of the ethical issues and security implications of quantum computing. This study will fill in the blanks on potential problems that might arise from quantum computing, offer solutions to these problems, and show how it can be easily implemented when new technologies are developed. We'll need to concentrate on topics like uncrackable encryption standards and secure key distribution. We'll also provide our results on the value of a robust governance framework, which refers to getting everyone on board with following a set of guidelines while using this technology. By creating standards, we hope to prevent people from deviating from their intended course when doing research. How to utilise it morally, and encryption standards you can rely on when new technologies are released. This paper clarifies the intricate ethical and security issues involved in managing quantum computing. By addressing these challenges, organizations and policymakers can harness the potential of quantum computing while safeguarding ethical principles and data security.

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Training and Applications of Quantum Computing for Entrepreneurs

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ABSTRACT - This study delves into the multifaceted domain of "Training and Applications of Quantum Computing for Entrepreneurs." The study's objective is to elucidate the significance of quantum training, explore quantum computing applications in entrepreneurship, address ethical and security considerations, and provide insights for entrepreneurs venturing into the quantum era. Entrepreneurs today face complex challenges that necessitate innovative solutions. This study identifies the gap in existing knowledge, highlighting the need for comprehensive training in quantum computing and practical guidance on its integration into entrepreneurial ventures. Employing a qualitative research approach, this study synthesizes a wide range of literature, historical developments, and case studies. The retrospective analysis utilizes past tense to provide a comprehensive overview of quantum computing fundamentals, training programs, applications, ethical and security considerations, and quantum entrepreneurship success stories. This research bridges the gap by providing entrepreneurs with a holistic understanding of quantum computing and its practical applications. It offers a conceptual framework to navigate the quantum landscape effectively. The study uncovers the transformative potential of quantum computing, empowering entrepreneurs to optimize operations, innovate, and gain a competitive edge. Ethical challenges, data security, and quantum-resistant cybersecurity measures are addressed, ensuring responsible quantum entrepreneurship. Entrepreneurs are urged to invest in quantum training, adapt their business models for quantum readiness, and incorporate quantum-resistant encryption. Collaborations, interdisciplinary teams, and strategic partnerships are recommended to drive quantum entrepreneurship success. Quantum computing presents an unprecedented opportunity for entrepreneurs to redefine industries and solve complex problems. This research equips entrepreneurs with the knowledge and insights needed to navigate the quantum frontier responsibly. As quantum technologies continue to evolve, entrepreneurs prepared to embrace them stand poised for innovation and success.

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SVM classifier Implemented with Advanced Fuzzy Set Theories for Image Analytics

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ABSTRACT - The evolution of Deep Learning (DL) enables the solutions for numerous real-time problems, including the finding of malignancies in the medical domain. The Convolutional Neural Network (CNN) delivers attractive and robust results in terms of classifying and detecting useful patterns from images that help radiology experts detect Breast Cancer (BrC) very accurately and on time. A novel multi-output based DeepCNN model with parallel hyper-parameter optimisation using Random Search and Bayesian Search methods is proposed in this study. The proposed model not only classifies the Mammogram images as normal, benign, and malignant but also determines the location of tumors and malignancies with an optimised approach. The tuning of the hyper-parameters process involves two different stages and parallel tuning of classification and localisation of the proposed model. The first stage involves tuning hyper-parameters in hidden layers, namely the number of filters, learning rate, number of epochs, batch size, and hidden activation. The second stage of hyper-parameter tuning involves the dense and classification layers that include dropout rate, model optimiser, and output activation. Further, the performance of the proposed deepCNN model is compared with six state-of-art transfer learning models, DenseNet169, EfficientNetB4, InceptionV3, ResNet101V2, VGG19, and Xception. Finally, the results of all the models are evaluated using metrics such as precision, recall, F1 score, and IoU that show the proposed model achieves the best test accuracy rate of 96.39% and IoU accuracy of 84.41% using the Bayesian Search approach as compared with Random Search approach and pre-trained models with the same configuration.

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A Noval Deep CNN Model for Breast Cancer Classification and Localisation Using Parallel Hyper-Parameter Optimisation Techniques

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ABSTRACT - The evolution of Deep Learning (DL) enables the solutions for numerous real-time problems, including the finding of malignancies in the medical domain. The Convolutional Neural Network (CNN) delivers attractive and robust results in terms of classifying and detecting useful patterns from images that help radiology experts detect Breast Cancer (BrC) very accurately and on time. A novel multi-output based DeepCNN model with parallel hyper-parameter optimisation using Random Search and Bayesian Search methods is proposed in this study. The proposed model not only classifies the Mammogram images as normal, benign, and malignant but also determines the location of tumors and malignancies with an optimised approach. The tuning of the hyper-parameters process involves two different stages and parallel tuning of classification and localisation of the proposed model. The first stage involves tuning hyper-parameters in hidden layers, namely the number of filters, learning rate, number of epochs, batch size, and hidden activation. The second stage of hyper-parameter tuning involves the dense and classification layers that include dropout rate, model optimiser, and output activation. Further, the performance of the proposed deepCNN model is compared with six state-of-art transfer learning models, DenseNet169, EfficientNetB4, InceptionV3, ResNet101V2, VGG19, and Xception. Finally, the results of all the models are evaluated using metrics such as precision, recall, F1 score, and IoU that show the proposed model achieves the best test accuracy rate of 96.39% and IoU accuracy of 84.41% using the Bayesian Search approach as compared with Random Search approach and pre-trained models with the same configuration.
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Prime Labelling of some Mycielski Graphs

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ABSTRACT - A graph G=(V(G), E(G)) with |V (G)| vertices is said to have prime labeling if there exists a bijection map f: V (G) → {1, 2, 3, ..., |V (G)|} such that for each edge e = uv in E(G), f(u) and f(v) are relatively prime. Two integers are said to be relatively prime if their greatest common divisor(gcd) is 1. In this paper, we examine prime labeling for the Mycielski graph of path graph, Cycle graph, and Laddar graph.

On the Signal Domination Number of Graphs

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ABSTRACT - The domination number is one of the most important parameters in graph theory. This article deals with the computation of a new domination parameter called the signal domination number which is derived from one of the distance parameters called as the signal distance. Furthermore, we obtain some results and work out the signal domination number of some families of graphs.

Radial Radio Mean labelling of Grotzsch Graph and Some Graphs

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ABSTRACT - A graph G is undirected with V vertices and E edges. This study introduces radial radio mean labelling of graphs, a novel method of graph labelling. A radial radio mean labelling of the undirected graph G is a function $\mathbf{g}: \mathbf{V(G)} \rightarrow \{\mathbf{1}, \mathbf{2}, \ldots, \mathbf{n}\}$ that satisfies the requirement $\frac{\mathbf{g(u)+g(v)}}{\mathbf{2}}$ between any two vertices u, v ∈ G and r(G) is the radius of G. The greatest integer in the range of a radial radio mean labelling g is the span, and it is represented by span(g). The minimal span over all G radial radio mean labellings is known as the radial radio mean number rrmn(G). The radial radio mean number of the Grotzsch graph and some graphs have been analyzed in this paper.

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Detection of Brain abnormality by a novel Enhanced Resnet Classifier from MR Images

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ABSTRACT - Medical image analysis (MIA) is a critical study subject in computer vision, with brain tumor (BT) diagnosis being the most explored due to its lethality. Using magnetic resonance imaging (MRI) to detect brain tumors allows doctors better to analyze the tumor's exact size and location. Existing techniques, however, may need to be more capable of accurately classifying human brain tumors. The ResNet-50 architecture is used in this study to categorize three forms of brain tumors based on MRI. This paper presents a deep-learning (DL) classification approach by employing CNN. To assess performance, use a confounding matrix to calculate sensitivity, specificity, false positive rate (FPR), false negative rate (FNR), false omission rate (FOR), false detection rate (FDR), and computation time. The deep learning technique ResNet-50 produced the best results, including Sensitivity (98.5%), Specificity (97.55%), Precision (98%), Accuracy (98%), and F1Score (98, 9%). The experimental results show that ResNet-50 improves performance and accuracy without sacrificing computation.

A Study on Research Issues in Deep Learning Based Cyber Security

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ABSTRACT - Due to the explosive expansion of networks over the past few years, cyber-attacks and attempts to steal data to gain illegal access have also been on the rise. Deep Learning (DL) can gain knowledge on its own without the assistance of individuals. In general, DL approaches have so far been widely used in fields like speech recognition and image processing. Nonetheless, DL methods are being used in the field of cyber security. In this study, we explore various DL techniques which have recently been proposed in the field of cyber security, together with their benefits and drawbacks, in order to increase the un-derstanding of diverse detection methods. For this survey, literatures were collected from different sources, and related papers are categorized under malware detection, intrusion detection, phishing/spam, and website defacement detection and research issues on this area are identified and discussed in an elaborate manner.

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Determination of vital nodes in social Networks: A Review

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ABSTRACT - A social network is a collection of social links and relations between individuals, organizations, and groups. One of the primary areas in the realm of continuing study is social network analysis. The rise of diverse social networks has considerably enhanced our daily lives while also posing a difficult problem in identifying the vital nodes within them. In these domains, avariety of methods have been devised and implemented, but some have included centralities, as well as their flaws and limits, in their research. As a result, various centralities have been developed overtime. The significance of nodes inside a social network is measured using the centrality index. This study provides a review of the research on identifying vital nodes in social networks. The purpose of this review is to describe past and current research on centralities for determining vital nodes in social networks. Finally, we present our future research plans based on measures of centrality.

Dynamic Utilization of Spectrum using Genetic Algorithm in Cognitive Radio Network

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ABSTRACT - The desire for better and quicker communication is rising along with the rapid evolution of wireless communication. People want to transfer data as quickly and as much as possible, which will inevitably lead to a spectrum shortage issue. Network resources are overwhelmed during this period due to high network utilization, which causes traffic on the network to increase. Therefore, network usage will take longer. In order to successfully sense and share the spectrum, we must concentrate on automatically monitoring the network in its immediate environment. The development of spectrum sensing technology in Cognitive Radio Networks (CRN) has made it possible to address the growing spectrum demand. People without licenses can easily use the spectrum when licensed (owner) users are not utilizing it. In this case, locate the optimum fit node nearby using the evolutionary algorithm fitness function, offer it to the secondary user (SU) from this optimized node, calculate the shortest distance, and then choose the node for the transaction. In order to achieve maximum network performance and evenly rationed resource consumption, the robustness or fitness function is used.

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Comparative Study on Types of Segmentation and Its Applications Using Deep Learning

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ABSTRACT - Image segmentation plays an important part in the pre-processing phase of images having as its ideal a partition of the image into factors or regions of interest for a more detailed analysis of one or further of these regions. Image segmentation may also be used as a pre-processing phase for better image de-noising or de-blurring that will be done in a separate image- processing phase. In this paper, an in- depth analysis is carried out on some constantly espoused image segmentation ways similar as thresholding- grounded ways, edge discovery-grounded, region- grounded ways, clustering, etc., and also discusses their advantages and disadvantages. This comparison study is useful for adding the delicacy and performance of segmentation styles in colorful image- processing domains. Deep literacy is an arising technology that evolves in machine literacy. The deep literacy conception is erected with numerous algorithms that help to train the input data set into different layers of perceptron.

Comparative Analysis of X-Ray, CT, and Ultrasound Images of Covid -19 with Deep Transfer Learning

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ABSTRACT - Effective patient management and disease containment depend on a prompt and accurate COVID-19 diagnosis. The VGG-19 architecture is used in this study to examine the use of deep transfer learning for COVID-19 detection in X-ray, CT, and ultrasound imaging modality. In order to determine how well the model can diagnose issues, it is important to evaluate how well it performs in each modality. This work, use three different pretrained models asVGG16, VGG19 and ResNet50V2 for the classifying different medical images in both individual and hybrid methods such as xray, ct, ultrasound, CT + X-ray, and CT + X-ray + ultrasound images. In ResNet50V2 are the deep networks it avoids the overfitting. Our findings highlight the diagnostic advantages of each imaging technique, recommending X-ray for quick screening, CT for in-depth analysis, and ultrasound as a substitute in some circumstances. The study advances knowledge of the medical application of deep learning algorithms throughout different types of imaging and highlights the value of customizable strategies depending on existing dataerent layer of perceptron

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Blockchain Integration with Algorithmic Systems: Real World Applications and Research Directions

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ABSTRACT - Blockchain technology has drawn a lot of attention because it has the power to completely transform a number of sectors by delivering safe and transparent transactional platforms. This abstract examines the bene and difficulties of integrating blockchain technology into various algorithmic applications. Decentralisation, immutability, and cryptographic approaches all contribute greater security, but increased transparency and auditability are also benefits. However, there are drawbacks to using blockchain in algorithms, including scalability issues, performance restrictions, energy usage, and regulatory issues. This abstract offer sin sights for researchers, developers, and business people interest edinrealising the potential of this gam e-changing technology by providing a succinct summary of the advantages and challenges of incorporating blockchain into various algorithmic systems.

Deep Learning Methods for Pneumonia Detection in Chest X-Ray Images

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ABSTRACT - Pneumonia is a common respiratory infection that necessitates accurate and timely detection in order to provide effective treatment and improve patient outcomes. Traditional methods of diagnosing pneumonia, such as manual interpretation of chest Xray images, are subjective and time-consuming. In this study, we look at how deep learning techniques can be used to detect pneumonia using chest X-ray images. The investigation

Energy-Efficiency of Sensors in Wireless Sensor Networks Utilizing the Cross-Layer Design Approach

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ABSTRACT -The primary challenge of wireless sensor networks (WSNs) is their limited energy efficiency and resource constraints at each device node. It is necessary to establish a direct communication between different protocol stack layers and to enhance the Quality of Service (QoS) provided by sensor nodes in WSNs. The Cross-Layer Design (CLD) is not only useful in improving the energy efficiency, network size but also improving overall performance of sensor nodes within the WSNs. The primary objective of this work is reducing energy consumption at only one layer while maintaining the QoS at all layers of the wireless sensor network protocol stack. In this study, the cross-layer design (CLD) strategy is discussed that mitigates energy depletion issues and addresses other QoS challenges at the Network Layer, Data Link Layer, and Physical Layers of the wireless protocol stack, thereby improving the overall performance of sensor nodes.

Vision Based Smart Light System Using OpenCV on Node MCU

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ABSTRACT. -Smart Light system has established its importance and benefits numerous times by providing immediate lighting of the house. This is because of the increasing amount of lights in a home or society which creates huge consumption of electricity and currently that is one of the major issue the society is worried about. Sensor based light system are not real-time because the sensor gets activated due to various environmental changes. To overcome this problem, many researchers are developing cost-effective custom-based Smart Light systems, which are affordable for everyone. Most of those systems use a Passive Infrared (PIR) motion sensor for motion detection. Although affordable, such a system still has many limitations such as false light triggered due to an abnormal condition such as rapid heating from aging of the devices, animals or insects passing/blocking the sensor and so on. In this work, a vision-based Smart Light system using OpenCV on NODE MCU is developed to improve the effectiveness of motion detection. This system would be monitoring the heat signs of the human-being continuously using the Night-Vison Camera that would be rotating all the sides to check for humans at equal intervals of time. Once human is detected, the software is designed in such a way that it sends the signal to the Arduino which is in-turn connected to the relay and therefore connected to various appliances such as light/fan etc. The developed prototype would be tested under a few conditions in the college premises to determine the accuracy of motion detection and how well the system is responding to the motion detected and the lights turning on. From the results obtained, the developed vision-based Smart Light system using OpenCV on NODE MCU has 100% of detection rate compared to the PIR motion sensor-based Smart Light System.

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Smart Helmet for Bike Riders for Accident Prevention

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ABSTRACT— Road accidents are increasing day by day because riders do not use helmet and due to alcohol consumption. A huge amount in today's world people die in traffic accidents. Accidents can occur when using a smart helmet detected. The Project Goal is to design smart helmets in case of accident alcohol avoidance and alcohol detection. The IR sensor checks if the person is wearing it helmet or not. The gas sensor recognizes the alcohol substance in the rider's breath. If the person doesn't have a helmet and if they are consuming alcohol, a bike won't start. If there are no signs of alcohol and a helmet is worn, then only the bike starts. The moment the rider meets with an accident, the sensor recognizes the condition of the motorcycle and reports the accident. Then The GPS in the bike sends the location of the accident site to the main server nearby hospitals.

Intelligent Hyperparameter Tuning Classification for MRI Brain Tumor Images with Deep Learning

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ABSTRACT - One of the most fatal diseases is a brain tumor, therefore earlier detection and diagnosis may prevent the loss of many lives. To reach this ultimate objective, several investigations and tests are being conducted globally. The most used method for treating brain pathological symptoms is MRI scans. The foundations of image processing are segmentation and classification. The afflicted region and the healthy section cannot be determined from a close-up examination of an MRI scan. To address this issue, different deep learning architectures have been developed. This study's primary objective is to classify tumors found in MRI brain scans. Although there are numerous deep learning approaches for medical images, the optimum method is required to identify the tumor component in cases of brain tumors. Preprocessing and classification-based tumor detection are part of this experimental setting. Preprocessing via data augmentation and classification using ResNet-50, Efficient Net, and Xception Net with hyperparameter tuning. A classification's effectiveness is measured by its accuracy, precision, recall, F1 score, and This study has a strong emphasis on reducing the experimental time of MRI brain pictures, which enables speedier disease analysis. Renet-50, EfficientNet, and Xceptio Net all attain accuracy levels of 97%, 95%, and 99.78%, respectively.

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A Review on Thalassemia Prediction Using Machine Learning

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ABSTRACT - A hereditary blood condition called thalassemia develops when the body is unable to produce enough haemoglobin. The first step in making a thalassemia diagnosis is a Complete Blood Count (CBC). Thalassemia does not yet have a treatment, however it is preventable via early thalassemia screening. Early detection makes it much simpler for patients to receive the appropriate care. It helps them have a longer lifespan and lowers the chance of passing on thalassemia to future generations. In this paper a comprehensive review of the models and RBC, MCH, MCV, HB and PLT values from the CBC test have been used as ways to predict thalassemia prediction and classification. It also covers the work done in thalassemia identification using the ensemble classifiers. Moreover, the comparative analysis of the existing techniques based on factors like dataset, testing data, ML technique type, and accuracy has also been performed for the better insights of the prominent techniques.

Strong Cocoloring of Some Snake Graphs

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ABSTRACT - A strong k-coloring is a proper k-coloring in which all the color classes are of same size. For sets to have equal size, k $\boldsymbol{n}$ $\boldsymbol{k}$ – n isolated vertices are added. An recoloring of a graph is a partition of the vertex set into r sets such that each set in the partition is either an independent set or induces a clique, where empty sets are permitted in the partition. Combining these two concepts, a new graph partition called strong co-coloring is defined. A strong r co-coloring is a partition of the vertex set into r sets of equal size in which each set in the partition is either an independent set or induces a clique and (if necessary) k $\boldsymbol{n}$ $\boldsymbol{k}$ – n isolated vertices are added. The new graph parameter called the strong co-chromatic number of a graph G is the least for which G has a strong r co-coloring. In this paper, we found exact bounds of strong co chromatic number of some snake graphs.

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A Survey on Stock Market Prediction Using Datamining

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ABSTRACT - Predicting the expense of the share market is the most unpredictable employment of the financial time arrangement. Forecasting of the stock should be conceivable by using the present and past data accessible on the market. There are various kinds of research done as such far with the ultimate objective to anticipate the stock market to finish the described estimations. A few procedures have been available in data mining for forecasting the stock market, this research gives which technique is the best to use for predicting the stock market. The paper is to consider various strategies to anticipate stock price development utilizing the sentiment analysis from web-based media, data mining and will discover proficient technique which can foresee stock development all the more precisely.

Paddy Crop Health Identification and Classification Using 1D-CNN Architecture

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ABSTRACT - The yield of paddy is highly limited by the factors such as nutrient deficiency, disease incidence, and pest attack. Therefore, the paper proposes a 1D-convolutional neural network (1D-CNN) architecture that uses empirical mode decomposition (EMD), and texture patterns for the classification of nutrient deficiency, disease, and pest in paddy leaf. Initially, the leaf image obtained from the paddy leaf is pre-processed by an entropy filter, and the resultant $\boldsymbol{RGB}$ image is used to obtain the $\boldsymbol{HSV}$ coefficients. Processes like sharpening, thresholding, dilation, and erosion are used to segment the leaf image which also enhances the texture components of the image. Several layers are then constructed along the periphery of the leaf from outer to inner. The multiple layers thus estimated are decomposed using the EMD algorithm from which the essential IMFs are selected and arranged to construct the 1D-texture pattern signal. The selected signal thus obtained are trained or classified using a 1D-CNN architecture. The 1DCNN architecture uses seven different classes such as healthy leaf, Hispa infected, leaf blast infected, brown spot infected, potassium deficient, phosphorous deficient, and nitrogen deficient. The evaluation of proposed leaf-diseased architecture was evaluated with metrics such as precision, specificity, sensitivity, accuracy, and F1-score. The scheme provides an F1-score, sensitivity, specificity, accuracy, and precision of $\mathbf{95.7}\%$, $\mathbf{97.1}\%$, $\mathbf{96.68}\%$, $\mathbf{97.92}\%$, and $\mathbf{97.23}\%$ respectively which is higher than the state-of the-art schemes.

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DNA Cryptography with Ensemble Key Generation to Secure Cloud Computing

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ABSTRACT - In cloud computing, information is becoming increasingly valuable; hence, it must be encrypted as soon as possible to prevent unauthorized individuals from gaining access to it. A fresh approach to key generation is presented here as a potential answer to the problem of client-side cloud computing. This solution comes in the form of a research study. This approach combines the processes of DNA encryption and decryption with the generation of ensemble keys. It was created from scratch just for the sake of this study. Following the first encrypting of the data with DNA encryption, the method next develops an asymmetric key using RSA and elgamal as its bases. This step is followed by the last step of decrypting the data. At long last, the data have been deciphered. The approach that has been proposed can be applied in order to carry out analysis on data linked to the traditional investigation. In this particular part of the study, in addition to focussing on key sensitivity and statistical analysis, we are going to be paying close attention to key space. The findings of the study led the researchers to the conclusion that the proposed method is robust enough to withstand an exhaustive attack and is appropriate for deployment in real-world scenarios. This conclusion was reached as a result of the findings of the research.

Intelligent Computing Approach for Sugarcane Leaf Disease Recognition Using Firefly Algorithm with Machine Learning

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ABSTRACT - Sugarcane, an essential crop helping various industries, is vulnerable to several leaf diseases, which can extremely decrease quality and yield. Early identification and accurate detection of these diseases are dominant for efficient crop preservation and management. This study introduces an innovative method, represented as "Intelligent Computing Approach for Sugarcane Leaf Disease Recognition using Firefly Algorithm with Machine Learning (SLDR-FFAML)," developed for revolutionizing disease identification in sugarcane leaf. The SLDRFFAML framework starts with bilateral filtering for preprocessing sugarcane leaf images, successfully diminishing noise while maintaining important image data. Then, the state-of-the-art Mobile Net architecture works as a feature extractor, taking discriminative patterns and representations from the preprocessed images. During hyperparameter tuning, a crucial stage in enhancing model performance is enabled by the Firefly Algorithm (FFA). FFA intelligently modifies key parameters of the machine learning (ML) approach, ensuring the model's effectiveness in disease identification. To attain accurate disease classification, an Elman Neural Network is utilized, leveraging the features extraction by Mobile Net. Experimental outcomes exhibit the excellent efficiency and accuracy of the SLDR-FFAML model in detecting sugarcane leaf diseases.

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A Survey on Split Domination Number of Graphs

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ABSTRACT - A dominating set $\mathbf{D} \subseteq \mathbf{V}$ is a split dominating set of a graph $\mathbf{G} = (\mathbf{V}, \mathbf{E})$ if the induced subgraph of $< V - D >$ is disconnected. The split domination number $\boldsymbol{\gamma s\ G}$ is the minimum cardinality of a split dominating set of a graph G. In this article, we establish a brief survey on the split domination number obtained in various research papers.

Multi Domain Image Retrieval Systems Using Object Detection and Segmentation Concepts

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ABSTRACT - Human beings easily perceive the information with more images than the text. A picture is worth a thousand words. In our real-time applications, picture is more useful than the textual data. An image retrieval system is a computer system for browsing, searching and retrieving images from a large database of digital images. Most traditional and common methods of image retrieval utilize some method of adding metadata such as captioning, keywords, or descriptions onto the images so that retrieval can be performed over the annotation words. A Pattern Based Image Retrieval (PBIR) system based on multi domain image databases are proposed in this paper. New steps which are included in image retrieval system are object detection and segmentation for better system performance. The patterns are extracted and they are worked at three levels to improve the performance of the system. Finally, evaluation is carried out for the performance of image clustering with medoid locations, medoid distances, accuracy, precision, and confusion matrix of multi-domain images for better understanding.

The Collection of Various βWs – Closed Sets in Topological Spaces

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ABSTRACT - In this paper, the conception of (βws-CS), (briefly Beta weakly semi-closed) sets through to TS are acquainted also studied an connection of these sets as companion any other generalized CS. Similarly, βws-Interior (briefly βws-Int), βws- Closure (briefly βws- cl), βws- Neighborhood (briefly βws-Nbd) along with βws-limit points through TS via applying this thought towards βws-CS are presented with studied part of its basic properties.

s*p* Continuous Maps in Topological Spaces

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ABSTRACT - The goal of this study is to establish and to study the different class of continuous map and irresolute map is known as semi star pre star continuous map (briefly s*p*continuous) and semi star pre star irresolute map (briefly s*p* irresolute) in topological spaces. Also discuss some basic properties of this continuous map. Further investigate the relationship between the newly defined map and the existing continuous map and irresolute map with suitable examples.

Geodesic Domination

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ABSTRACT - A geodesic between two vertices in a graph G is a shortest path joining them and it is also called isometric path. Given agraphG(V, E), a set S of geodesics is said to be a geodesic dominating set if every vertexv∈V is either belongs to some geodesic of S or is adjacent to some vertex of some geodesic of S. If S is a geodesic dominating set, then V(S) is a dominating set of G. In other words, a geodesic dominating set S is a set of geodesics such that V(S) dominates V. The geodesic domination number is the number of geodesics in a minimum geodesic dominating set of G and it is denoted by gd(G). The geodesic domination problem is to find a minimum geodesic dominating set of G. The bounds and properties associated with the geodesic domination problem have been discussed. The problem is solved for block graphs and certain cartesian product graphs. It is also proved in general the geodesic domination problem is NP-complete.

A Hybrid Model for Multilevel Thresholding Segmentation for Detecting Leaf Disease in Groundnut Plants

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ABSTRACT - In this paper, a hybrid segmentation technique is one of the approaches for detecting agricultural diseases in groundnut plant leaves using the multilevel thresholding segmentation method. Various comparative analyses were done using soft computing techniques [1] [2]. In this work, the Krill Herd algorithm and Dragonfly algorithm are used to find the global and local optimization for improving accuracy for detecting the disease in groundnut plant leaves. The proposed hybrid method is named as Enhanced Krill Herd-Dragonfly algorithm (EKHD algorithm). The robustness of the EKHD algorithm was verified in the experiment results. The various pre-processing methods and colour image segmentation

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methods were used for disease identification and the proposed method gave more accuracy than available methods. This segmentation method can be a part of finding the affected portion of the plant leaves. The proposed method proves the accuracy of the results of the experiments.

Transformer Based U-Net Model for Segmentation of Paddy Leaf Disease

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ABSTRACT - Paddy leaf disease are common problem in rice cultivation. These diseases can significantly impact crop yield and quality. Several types of disease can affect paddy leaves, and each has its own characteristic and management strategies. Segmenting paddy leaf diseases is an essential process to identify and separate areas of an image that show signs of disease from healthy areas of paddy leaves. This process plays crucial role in agriculture for early disease detection and management. It is an open challenge for the researchers to identify the efficient segmentation technique to strengthen precise early disease detection. Therefore, this study developed a transformer based Unet(TransUNet) model for segmenting the paddy leaf disease. Three different paddy leaf disease images are utilized to train and evaluate the TransUNet model. The performance analysis shows that the TransUNet model obtained higher segmentation accuracy 0.9964 and 0.9974 for pixel accuracy and mean pixel accuracy respectively.

Novel Maze Shape Patch Antenna Using HFSS for Satellite Communication

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ABSTRACT - This study presents the theoretical design of a microstrip patch antenna with a maze-like structure, featuring co-axial probe feeding techniques, specifically optimized for operation at 4.1 GHz. The analysis was conducted using the High Frequency Structure Simulator (HFSS) software. A key novelty in this work is the utilization of a dual Fr4 substrate configuration, separated by an air gap, in the design of the microstrip patch antenna, in contrast to the conventional single-substrate approach. The antenna's performance was assessed through the evaluation of essential parameters such as return loss, voltage standing wave ratio (VSWR), and radiation pattern, among others. Notably, the proposed theoretical antenna design demonstrates promising suitability for applications in the C band.

Design of 1D Ternary Photonic Crystal-Based Anti-Reflective Coating Using Transfer Matrix Method for Solar Cells

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ABSTRACT- Recently, multilayer anti-reflective coating (ARC) design seems to be more promising since material with refractive index lower than glass is no longer required. Photonic crystals (PhC) are a perfect candidate for designing an optimal ARC, because of its unique optical properties. We propose an ideal ARC design made of one-dimensional ternary photonic crystal (TPC) with MgF2, ZnS and Al2O3 as three alternating layers. Transfer matrix method (TMM) is implemented in this study and MATLAB software is used for simulations. A comparative analysis between binary PhC and ternary PhC is done at a fixed Bragg's wavelength (λB). We have obtained minimum reflectance of 3.57% in the visible region in which the wavelength is varied from 300 nm to 600 nm. It is also observed that the minimum reflectance is observed for an extended period of wavelength region upto 900 nm when λB is varied. Hence, this wide bandgap TPC based ARC is suitable to enhance the overall efficiency for solar cells.

New Correlation Coefficients and Aggregation Operators for Solving Linguistic Intuitionistic Triangular and Trapezoidal Fuzzy MAGDM Problems

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ABSTRACT - In this study, we address MAGDM problems with many attributes, such as linguistic degree, membership, non-membership, and hesitance degree. We offer linguistic-intuitionistic triangular and trapezoidal fuzzy sets and propose new operations to aggregate linguistic -intuitionistic triangular and linguistic intuitive trapezoidal fuzzy numbers. The alternatives are also ranked using correlation coefficients. The proposed operators and correlation coefficients are then numerically illustrated to demonstrate their effectiveness in resolving MAGDM problems with linguistic-intuitionistic triangular fuzzy sets and linguistic-intuitionistic trapezoidal fuzzy sets.

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Enhancing Smart Farming with Green-IoT: An Energy Efficient Perspective

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ABSTRACT - The Internet of Things (IoT) as a revolutionising technological innovation has diverse applications that includes Precision Agriculture and smart farming. The IoT technology when approached with the focus on energy efficiency and eco friendliness, it paves way for Green Internet of Things (G-IoT). The paper discusses the role of G-IoT in enhancing smart farming that thrives on data-driven decision-making. The paper analyses various studies on IoT-enabled smart farming architectures containing smart devices, and optimization algorithms. The work proposes an enhanced architecture for smart farming aimed at realising G-IoT. Also, a Modified Directed Acyclic Graph (DAG) Based Fast Forward Optimization Algorithm (MDAGFFO) is proposed to optimise the energy usage in G-IoT based Precision agriculture. It is an artificial intelligence (AI) technique which enhances energy efficiency and extends the life of smart devices. The experimental results portray the efficiency of the technique propose.

Efficiency enhancement of solar cell with 1D Photonic Crystal as back reflector using Transfer Matrix Method

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ABSTRACT - This research investigates the enhancement of optical properties in a one-dimensional binary photonic crystal composed of two distinct materials: a metal-doped composite material, Ag-doped ZnS (referred to as the A layer), and CaF2 (the B layer). The refractive index of the Ag-ZnS nanocomposite system is calculated using the Maxwell-Garnett equation. Reflection spectra of the system are analysed employing the Transfer Matrix Method, with numerical simulations executed in SCILAB. Variations in the photonic bandgap are systematically examined by altering the number of crystal periods, fill factor, and layer thickness. The results indicate that wider photonic bandgaps are achieved with increased layer thickness and fill factor, rendering the structure an exceptional Distributed Bragg Reflector (DBR) within the visible spectrum, offering significant potential to enhance solar cell efficiency.

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Finding Type of Intrusion Detection in Wireless Sensor Network using K Nearest Neighbour

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ABSTRACT—Wireless sensor network (WSN) deployments have increased considerably in recent years. WSN's small footprint and low price point are enticing many businesses to incorporate them into a variety of settings. This kind of innovation has a wide range of potential uses including precision farming, building security, as well as tracking the environment. However, WSNs are vulnerable to serious security threats since most of these threats are spread in unsupervised environments with hostile weather. Several methods are offered to ensure the security of data as it travels from the sensors toward the base station, to provide confidential data handling within the WSN. The focus of this study is on attack detection, a crucial activity for securing a network and its data. To ensure the safety of wireless sensor networks and uncover any malicious attempts, the identification of anomalies is an essential responsibility. Different machine learning strategies were utilized by scientists nowadays to spot discrepancies utilizing disconnected learning calculations. This work is aimed to deliver an intrusion detection model having the uniqueness of a wireless sensor network. In this research, the KNN model is used to find the detection result of WSN. The detection accuracy is concentrated on traffic data, flooding, black hole attack, and scheduling.

Threshold Based Fuzzy-Rough Quick Reduct Algorithm for Feature Selection in Brain Computer Interface

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ABSTRACT - The performance of feature selection involves choosing a subset of features that have a strong correlation with classification results and little dependence on other features. In this paper, rough set theory is utilized as a research tool, and proposed a novel Fuzzy Rough Based feature selection has been applied on BCI data sets which selects most significant features, enhances classification accuracy and run faster than the earlier approach. A threshold-based halting criterion was used to halt the Quick Reduct algorithm from adding more features. The performance and efficacy of our suggested approach are confirmed by experimental findings using datasets from BCI.

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A Multiple Linear Regression Approach to Select Next Generation Football Players for Indian Team

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ABSTRACT - By including the physical and performance criteria in the Indian Super League, ISL Season 6 & 7 Player Stats, multiple linear regressions are used in this study to estimate the market prices of football players in the forward positions. Players from India's two top leagues are analyzed, and the player who would perform well in the upcoming league is identified using a multi-linear regression test. The correlation is also thoroughly described.

Analysis and Prediction of Breast Cancer using Machine Learning Classification Approaches

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ABSTRACT - Breast cancer is a serious global health issue, and early and accurate detection is critical for effective treatment and improved patient outcomes. The use of data mining techniques on medical records related to breast cancer can reveal valuable insights, such as behavioral trends and frequent/rare item trends. Wisconsin datasets on breast cancer that were taken into consideration from the repository for machine learning at UCI were utilized for analysis. The study is been implemented on different classification algorithms (Naïve Bayes, Sequential Minimal Optimization (SMO), Attribute Selected Classifier, Decision Stump, J48) utilizing Weka 3.8.3 to predict the best model. Feature selection is applied by Wrapper-Subset-Evaluation in all algorithms.

Neural Network Based Medical Self-Diagnostic System Using Artificial Intelligence

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ABSTRACT - Diseases such as disorders in health condition among the people can be identified and diagnosed with the help of Artificial Intelligence techniques. Accurate predictions in the field of medical diagnosis in diversified fields are required by application of accurate algorithms. Earlier conventional practices of diagnosis were practiced manually which are prone to errors. Compared with human expertise, practice utilization of predictive

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techniques of Artificial Intelligence (AI) supports auto diagnosis and it reduces the error rate. In this paper an analysis is made on various artificial intelligence techniques that are used presently such as Support Vector Machine (SVM), K-means algorithm, Fuzzy logic, neural network is considered, and an optimized fuzzy logic based neural network method is designed. Observing the working model of current practices, a new technique is developed for obtaining accurate results by considering different parameters. Finally, future developments in research work are explained with the help of Artificial Intelligence based diagnosis system on the challenges faced in today's medical self-diagnostic system.

Touchless Hand Sanitizer Dispenser Equipped with Temperature Detection and Heart Rate Monitoring System

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ABSTRACT - The goal of this study is to develop a low-cost Touchless hand sanitizer dispenser. Infrared sensors are commonly used in touchless hand sanitizer dispensers to detect the presence of a hand without requiring direct human intervention. In our project, an infrared sensor detects proximity and sends a signal to the microcontroller. Furthermore, our project includes temperature and heart rate measurement, with the results displayed on an LCD screen. This feature assists in the early detection of potential virus symptoms, such as those associated with COVID-19, allowing for prompt detection in its early stages.

Glaucoma Diagnosis Using Empirical Wavelet Transform and Correntropy Features Extracted from Fundus Image

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ABSTRACT - Glaucoma, an ocular condition marked by increased pressure within the eye, results in damage to the optic nerve and gradual vision deterioration. Contemporary methods for diagnosis, such as Heidelberg Retinal Tomography (HRT), scanning laser polarimetry (SLP), and optical coherence tomography (OCT), come at a high cost and require specialized skills for accurate interpretation. As a result, there is a growing demand for a more affordable and automated method for diagnosing glaucoma. The Empirical Wavelet Transform is used to automatically diagnose glaucoma in digital fundus images in this study. It is employed to break down the images, and correntropy-based characteristics are extracted from the resultant EWT elements. The t-value feature selection technique is applied to rank these characteristics. Subsequently, the selected attributes are utilized to distinguish between images depicting normal conditions and those affected by glaucoma using the Least Squares Support Vector Machine (LS-SVM) classifier. This approach demonstrates promise in providing an accurate diagnosis for glaucoma in a cost-efficient manner.

A Note on Hyper Connectedness in N–Topological Spaces

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ABSTRACT - In this paper, the notions of N-topological hyper connectedness and Nτ-hyperconnected components have been studied in N-topological spaces and also extend in to Nτ- point wise hyper connectedness in the space. The relation between Nτ-hyperconnected spaces and Nτ-point wise hyper connectedness has also been examined. With the help of Nτ-hyperconnected components, the dimension of a N-topological space has been obtained, and also a new space namely Nτ-noetherian space have been studied as an application to Nτ-hyperconnectedness and Nτ-hyperconnected components.

Contra Continuous Multifunctions in Terms of Nano Topology

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ABSTRACT - This paper aims to introduce and study the Nano contra continuous multifunction. We obtain their characterizations and some basic properties of such multifunction. Further, Nano upper and lower continuous multifunction, Nano upper and lower clopen continuous functions are analyzed. Finally, Nano weakly continuous multifunction implications are established.

A Review on Plant Disease Identification Using IoT

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ABSTRACT - In farming, crops are prone to a wide variety of diseases. Identification of disease is extremely difficult in agriculture field. Apart from irrigation, plant needs to be free of diseases. Leaf Disease Detection in agriculture is being done manually for many years. The objective of the paper is to discuss about the prototype system for detecting the paddy diseases, which are Paddy Blast, Brown Spot and Narrow Brown Spot diseases. This concentrate on the image processing techniques used to find pattern in the image and artificial neural network technique to classify the diseases. The methodology involves image collection, image processing, feature extraction and classification. The existing models are trained on real life leaf images of crops, captured from an actual agricultural field. A user-intuitive IoT Web Application is developed to capture process and display the predicted result (disease status) from the model. The future direction of the paper is that, the identification of disease of plants by using artificial intelligence with machine learning algorithms.

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Exploration of Artifact Removal for Mammogram Image Segmentation

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ABSTRACT - The most common form of cancer among women is breast cancer. Early breast cancer identification is essential to lowering mortality. The most reliable method for early breast cancer screening is now digital mammography. Experts agree that the greatest approach to stop the disease from spreading and raise the survival rate is through early detection. Image processing research on removing noise from the raw image is still difficult. There isn't typically a standard enhancing method for noise reduction. There have been several methods proposed, and each has its own presumptions, benefits, and drawbacks. Medical images taken during mammography frequently contain impulsive noise. This work proposes alternative filtering solutions based on statistical techniques to remove impulse noise. The proposed filtering model is used to validate a number of successful full experiments. Signal-to-Noise Ratio (SNR), Peak Signal-to-Noise Ratio (PSNR), and Root Mean Square Error are statistical quantity measures that are used to evaluate the quality of improved images (RMSE).

Gland Segmentation in Weakly Supervised Microanatomy Images from Online Easy Example Mining

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ABSTRACT - For autonomous cancer detection and prediction, developing a system for AI assisted gland segmentation from microanatomy pictures is essential; yet, the high cost of pixel level annotations prevent its use for illnesses that are more widespread. Currently, minimally supervised semantic segmentation techniques for the segmentation of glands in computer vision have detrimental effects because glandular datasets differ from other datasets in terms of their properties and issues. To this purpose, we propose a novel approach called Online Easy Example Mining (OEEM), which encourages the network to concentrate on reliable supervision signals rather than hence, reducing the impact of inescapable incorrect predictions is achieved through noisy signals. In phony masks. Taking into account the traits of glandular datasets, we create a reliable framework for segmenting glands. Our outcomes beat many others both rigorously regulated and loosely overseen procedures for glandular Segmentation of over 4.4% and 6.04%, respectively, at mIoU.

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