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1. GuavaCareNet: Empowering Guava Farms with Federated Learning for Real-Time Disease Diagnosis

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GuavaCareNet: Empowering Guava Farms with Federated Learning for Real-Time Disease Diagnosis

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Abstract— This research presents a Federated Learning-based approach for the detection of guava leaf diseases, aimed at enhancing agricultural practices while ensuring data privacy. Guava farms across various regions provide images of guava leaves, both healthy and diseased, to train a deep learning model for disease classification. The EfficientNet-B3 model, optimized with Neural Architecture Search (NAS) and Transfer Learning, is used for accurate disease detection, including conditions like Anthracnose and Powdery Mildew. To ensure privacy, Federated Learning (FL) is employed, where the model is trained locally on edge devices such as smartphones and Jetson Nano devices situated at guava farms. These devices process the data locally and send model updates, rather than raw data, to a central server. This method enables the aggregation of knowledge from multiple farms without sharing sensitive information, thereby protecting farmers' data privacy. The use of Federated Learning allows the model to adapt to specific conditions at each farm, such as different diseases, leaf appearances, and lighting variations, improving its robustness and accuracy. Additionally, AWS IoT integration allows real-time monitoring and alerts, further empowering farmers with timely disease detection. The decentralized nature of this approach not only enhances disease detection in guava crops but also fosters data privacy, ensuring farmers' information remains secure.

Keywords— Hyperspectral imaging, Guava fruit quality assessment, Neural network optimization, Yield optimization, Sustainable farming, Guava disease detection, EfficientNet-B3,

major losses, leading to economic setbacks for farmers. Traditional disease identification methods rely on manual inspection, which is labor-intensive, subjective, and prone to errors. An automated and efficient detection system is essential for small and marginal farmers to improve productivity, reduce losses, and enhance fruit quality for both domestic and export markets. India produces around 4.6 million metric tons of guava annually, with increasing demand due to its nutritional benefits and wide use in fresh consumption and processed food industries. However, disease-infected guavas lead to post-harvest losses estimated at 15-20% of total production, affecting market supply and profits. Ensuring high-quality guava through advanced disease detection can stabilize market prices and support farmers' earnings. Traditionally, guava disease detection is done through visual inspection, which is subjective, time-consuming, and impractical for large farms. Expert consultations and laboratory tests add to costs, while existing automated methods often require high computational power or struggle with natural image variations. The proposed guava disease detection system leverages the EfficientNet-B3 deep learning model, offering high accuracy, real-time detection, and scalability. It processes images quickly, enabling immediate disease identification. The model is adaptable to field conditions and can be integrated into mobile or cloud-based applications, making it cost-effective

2. DiabEyeNet: Integrating Residual Inception Networks and Chaotic Optimization for Robust Diabetic Retinopathy Detection

[Home](#) > [Iranian Journal of Science and Technology, Transactions of Electrical Engineering](#) > Article

DiabEyeNet: Integrating Residual Inception Networks and Chaotic Optimization for Robust Diabetic Retinopathy Detection

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Abstract

Among individuals with diabetes, Diabetic Retinopathy (DR) stands out as a primary cause of vision loss and potential blindness. Many of the already existing diagnostic methods are complex and require an expert eye to give any meaningful interpretation, thus making a case for the application of the latest technology in fast-tracking disease detection. These models have precedence to improve diagnostic accuracy and speed over traditional processes. Motivated by these deep learning opportunities, this paper presents the DiabEyeNet model dedicated to DR detection and classification. The DiabEyeNet model integrates the Residual Inception Multimodal Fusion Network (RIM-FuseNet) with the Crested Porcupine Chaotic Levy Optimization (CPCLO) to mitigate the problems associated with DR identification. The RIM-FuseNet part takes inspiration from residual learning, which guides the model to extract and further distill more precise features for increasing the model's response to different DR stages. CPCLO optimization technique adjusts the model parameters and improves the performance indicators of the model and

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3. A Comprehensive Review of Federated Learning and Explainable AI Approaches for Privacy-Preserving Breast Cancer Detection: Advancements in Multi-Modal Data Fusion, Interpretability, and Clinical Trust



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A Comprehensive Review of Federated Learning and Explainable AI Approaches for Privacy-Preserving Breast Cancer Detection: Advancements in Multi-Modal Data Fusion, Interpretability, and Clinical Trust

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Abstract

In this review paper, a comprehensive review of federated learning and explainable ai approaches for privacy-preserving breast cancer detection is presented. Advancements in Multi-Modal Data Fusion, Interpretability, and Clinical Trust. Breast cancer remains one of the leading causes of mortality among women worldwide, demanding diagnostic solutions that are accurate, secure, and clinically interpretable. With the rapid growth of artificial intelligence in healthcare, federated learning (FL) and explainable AI (XAI) have emerged as complementary paradigms that address two critical aspects: preserving patient privacy while ensuring transparency in decision-making. This review paper explores how FL enables collaborative model training across distributed clinical institutions without centralizing sensitive medical data, while XAI frameworks enhance trust by making predictions understandable for clinicians. A special emphasis is placed on multi-modal data fusion—integrating mammography, histopathology, genomics, and electronic health records—to improve diagnostic robustness and reliability. The paper synthesizes current advancements, challenges, and future directions, highlighting how privacy-preserving FL techniques, combined with interpretable models, can foster clinical trust and adoption in real-world healthcare systems. By comparing state-of-the-art

4. Mock interviewer

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Mock Interviewer

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Abstract: Rapid growth in digital recruitment has led to the need for scalable, objective and intelligent interview preparation (and assessment) systems. The majority of traditional interview techniques rely on human responses, which are often inconsistent and subjective. However, only a few candidates can provide such feedback without difficulty. The paper presents AI Interviewer, a web-based interview preparation tool that assists candidates with automated interview practice, detailed performance analysis, resume optimization, and ATS compatibility assessment. Real-time video and voice interviews, AI-led role specific questions, live transcription, and natural language-based evaluation of candidate responses are all supported by the platform. Moreover, it includes an integrated resume analyzer that uses ATS for scoring tasks and provides feedback, as well as a resume builder that can generate resumes tailored to job functions. Firebase-powered cloud storage is used to store all analytical reports and historical performance metrics. This system emphasizes the importance of being comprehensible, impartial and easily applicable. Using real-life scenarios on platforms, the effectiveness of using multimodal assessment and dashboard-based feedback has been demonstrated to enhance candidate preparedness. In today's recruitment ecosystems, the platform is a complete AI-powered solution.

Keywords: Artificial Intelligence, AI Interviewer, Multimodal Learning, Resume Analyzer, ATS Scoring, and Interview Automation.

1. INTRODUCTION

For many recruitment processes, interview preparation is crucial, especially for students and early-career professionals. Misfits in preparation methods, such as mock interviews with peers or mentors, are frequently impeded by their lack of availability and subjectivity, as well as the absence of structured feedback. In addition, the use of applicant tracking systems during resume screening has created more complications for those without knowledge of ATS optimization criteria.

Advances in artificial intelligence have made it possible to create intelligent systems that can automate human-centric tasks such as evaluation, feedback generation and performance analysis. Several AI-powered interview systems have gained attention for their ability to offer reliable, consistent, and data-driven assessments. Many existing solutions are either too automatized or do not offer transparency and practical integration.

This article discusses the integration of AI Interviewer, a comprehensive interview preparation tool that assesses candidates through standardized tests using multiple modalities. This is to help candidates improve their interview performance and resume quality by providing clear, AI-generated feedback.

II. LITERATURE SURVEY

A. Artificial Intelligence in Recruitment (2018–2024)

The adoption of artificial intelligence in recruitment has increased significantly due to the demand for scalable and efficient hiring processes. Early AI-based recruitment systems primarily focused on automating resume screening through keyword matching and rule-based filtering. While these systems reduced manual effort, they lacked semantic understanding and often produced inconsistent outcomes. Prior studies highlighted that AI can enhance decision-making in talent acquisition by providing data-driven insights rather than replacing human judgment entirely, while also warning about risks

5. Traffic and Accident Prediction in Visual Data using Deep Learning

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Traffic and Accident Prediction in Visual Data using Deep Learning

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Abstract: In this study, a basic CNN is used to detect accidents from images taken by surveillance cameras. The method sorts the traffic scenes either as crash cases or normal ones, reaching close to 91 percent correct classifications during testing. Data handling steps are explained along with the model structure and how it was trained, followed by performance numbers. Practical use in smart transport setups is considered; next steps include improving reliability, adding time-sequence analysis, plus running the system on low-power devices. Results show even straightforward deep learning designs may work well for spotting crashes, suggesting possible adoption in roadside units or vehicle-mounted monitors.

Keywords: Convolutional Neural Network (CNN), Accident Detection, Computer Vision, Intelligent Transportation Systems (ITS), Deep Learning, Traffic Monitoring, CCTV Surveillance.

INTRODUCTION

Road crashes are still a top reason for deaths and financial damage globally. As cities grow quickly, more vehicles fill roads that keep spreading - this raises demand for solid traffic monitoring tools. Old ways of spotting collisions often depend on people watching footage, emergency alerts, or physical sensors; however, each method brings issues like late detection, expensive setup, or reliance on someone noticing manually. When accidents aren't caught fast, help arrives slower - which may worsen injuries while also jamming up movement across routes.

Thanks to progress in AI and visual computing, deep learning has become a key method for automatic scene analysis. Specifically, CNNs perform well when identifying objects, sorting images, or recognizing patterns. Because they detect layout traits straight from unprocessed visuals, these networks handle complicated traffic footage from surveillance systems effectively - using data without prior filtering. Their design allows interpretation of real-world environments seen through camera feeds.

In this study, we design a CNN-driven tool to detect accidents by examining CCTV footage, sorting images into incident or no-incident groups. Our approach uses labeled data, along with image refinement methods, while enhancing the model for better precision. Instead of relying on sensors, it works straight from current surveillance cameras - reducing expenses and allowing smooth use within urban tech and traffic management setups.

The key outcomes of this work include the following:

1. building an organized collection of images to identify accidents.
2. the creation plus testing of a CNN system for sorting traffic pictures accurately.
3. evaluation of the system through performance indicators like accuracy, error rate, or confusion matrix.
4. exploring how it works in practice, while considering improvements for actual use cases.

This study shows deep learning can speed up accident spotting, boost real-time understanding, while also enabling quicker

6. Interest-Based Career Domain Recommender Using Personality Profiling

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Interest-Based Career Domain Recommender Using Personality Profiling

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Abstract: This work presents an Interest-Based Career Domain Recommender System that helps students choose suitable career paths through personality and interest analysis. The system uses the Big Five Personality Traits (OCEAN) alongwith dynamic questionnaire to provide personalized career suggestions. A rule-based and AI-supported recommendation engine matches student traits with relevant career domains. The system also offers career road maps, curated resources, and chatbot support to guide students further. With an adaptive feedback mechanism, recommendations improve over time. Overall, the system aims to reduce career confusion, improve decision-making, and provide a scalable solution for educational institutions.

Keywords: Career recommendation, OCEAN personality model, interest profiling, AI-driven guidance, adaptive learning, student decision-making, personalized career pathways.

INTRODUCTION

Career selection plays a crucial role in shaping a student's academic growth, professional development, and overall future success. However, many students struggle to choose an appropriate career path due to limited awareness, lack of personalized guidance, and insufficient understanding of their own strengths and interests. With rapid advancements in technology, intelligent decision-support systems have become essential in assisting students to make informed choices. In recent years, psychological assessment models and AI-driven tools have gained prominence for providing personalized recommendations that go beyond traditional counselling methods. The proposed system leverages the Big Five Personality Traits (OCEAN) combined with interest-based profiling to deliver career suggestions that align with a student's personality, preferences, and skills. The system incorporates a dynamic questionnaire, an AI-assisted recommendation engine, and rule-based mapping that connects psychological traits to relevant career domains. By integrating detailed roadmaps, curated learning resources, and real-time chatbot support, the platform enhances the quality of guidance and enables students to explore their chosen domains more effectively. Existing career counselling methods often rely on manual assessments, one-size-fits-all recommendations, and limited data-driven insights. These approaches may lead to confusion, wrong career choices, or academic dissatisfaction. The proposed intelligent system addresses these limitations by offering a more structured, personalized, and scalable solution capable of serving large student populations across institutions. Moreover, the system supports continuous refinement through an adaptive feedback mechanism, improving recommendation accuracy over time. Its accessibility and ease of use make it suitable for academic institutions, training centers, and individual learners. By combining psychological profiling, AI-driven analytics, and interactive guidance, this platform aims to reduce career mismatches, enhance decision-making, and empower students to discover career paths that truly align with their potential, with minimal knowledge to develop robots for protective purposes.

II. SYSTEM METHODOLOGY

1.Data Collection: Students begin by completing a dynamic questionnaire designed to capture their interests and measure their Big Five Personality Traits (OCEAN).

7. Detection of Parkinson's Disease Using Spiral Models

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Detection of Parkinson's Disease Using Spiral Models

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Abstract: Parkinson's Disease (PD) is a steadily worsening neurological condition that affects millions of individuals around the world. Early diagnosis remains a major challenge due to subtle initial symptoms and limited access to trained neurologists. This paper proposes an automated and explainable deep-learning approach designed to identify PD at an early stage using spiral drawing tests. Using transfer learning with VGG19 and explainable AI methods such as LIME, the proposed model identifies tremor-induced distortions in drawings and highlights regions contributing to classification. The model demonstrates high accuracy and interpretability, positioning it as a reliable tool for assisting clinical diagnosis.

Keywords: Parkinson's Disease, Spiral Drawings, Parkinson's Disease, Spiral-Based Drawings, Deep Neural Models, Transfer-Learning Techniques, Convolutional Networks, Explainable Artificial Intelligence, LIME., Explainable AI, LIME.

1. Introduction

Parkinson's Disease (PD) is the second-most common neurodegenerative disorder, characterized by motor symptoms such as tremors, rigidity, and bradykinesia. Traditional diagnostic procedures involve clinical examinations and subjective assessments, making early-stage detection difficult. Spiral drawing tests, commonly used in neurology, help assess motor control irregularities caused by PD. With the advancement of artificial intelligence and deep learning, automated assessment of such tests has become viable.

This research focuses on applying convolutional neural network (CNN) models to interpret spiral-drawing patterns from both healthy individuals and PD patients. The aim is not only to classify but also to explain the reasoning behind the model's prediction using Local Interpretable Model-Agnostic Explanations (LIME). Such interpretability is essential in medical settings, as AI-generated outcomes need to be clearly interpretable and reliable in healthcare applications where AI decisions must be transparent and trustworthy. The study contributes by providing a lightweight, accurate, and explainable diagnostic tool using simple input data.

2. Literature Survey

A wide range of research has investigated handwriting patterns and drawing-based assessments as potential indicators for diagnosing Parkinson's Disease. Earlier machine-learning techniques relied on manually designed features, including writing speed, curvature, pressure variations, and stroke smoothness. However, these features are often insufficient to capture subtle variations in PD drawing patterns.

Deep learning techniques revolutionized this domain by enabling automatic feature extraction. CNN architectures trained on spiral and wave-form drawings have achieved classification accuracies between 90% and 98%. Studies by Zham et al. and Pereira et al. demonstrated that spiral drawing irregularities correlate strongly with motor dysfunction.

8. AI - Play Ground: Empowering Kids to Build and Understanding ML Apps

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AI - Play Ground: Empowering Kids to Build and Understanding ML Apps

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Abstract: As artificial intelligence (AI) becomes an increasingly integral part of daily life, equipping younger generations with the tools and knowledge to understand and create with AI is essential. This paper presents the design, development, and evaluation of a children-oriented AI design platform that enables users to create, test, and deploy machine learning (ML)-driven applications with minimal coding knowledge. The platform focuses on intuitive visual programming interfaces, age-appropriate ML model training workflows, and real-time deployment capabilities. Through iterative user testing with children aged 8–14, the system was refined to prioritize usability, engagement, and educational value. The platform integrates pre-built AI models for tasks such as image recognition, text classification, and voice commands, while also allowing customization and experimentation. Our results demonstrate the platform's effectiveness in fostering computational thinking, design creativity, and basic AI literacy. We conclude with insights into designing child-friendly AI tools and propose future directions for expanding accessibility and curriculum integration.

Keywords: Artificial intelligence (AI), machine learning (ML), Real-time deployment, Pre-built AI models.

1. Introduction

As artificial intelligence (AI) becomes an integral part of modern life, it is crucial to ensure that the next generation is not only capable of using AI tools but also empowered to create them. Today's children are growing up surrounded by smart devices, recommendation systems, and automated assistants. Yet, the complexity of Machine Learning (ML) development ranging from coding environments to data pipelines creates a significant barrier for young learners who wish to engage with these technologies creatively and meaningfully. To address this challenge, we propose the creation of a child-friendly AI design platform that allows children to build, experiment with, and deploy their own ML-powered applications.

The proposed platform is built on a simple yet powerful philosophy: **learning by doing**. Instead of teaching AI through textbooks or complex code, transforms the learning process into an interactive, playful experience. Designed for children aged **8 to 14**, it aligns with their cognitive development and supports curiosity-driven exploration. This environment introduces essential AI concepts such as data collection, model training, inference, and iterative improvement through hands on tasks rather than abstract theory. A key feature of this platform is its **visual, block-based programming** interface. Similar to Scratch, which made programming accessible to millions of children, this interface enables users to create AI behaviors by connecting intuitive visual components. Children can drag and drop blocks to define how a model should receive data, learn from it, and produce outputs. This removes the intimidation of syntax errors and complex code structures, allowing children to focus on creativity

9. Apti Hub – Aptitude Learning Platform

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Apti Hub – Aptitude Learning Platform

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Abstract: Campus placement preparation requires consistent practice in quantitative aptitude, logical reasoning, and analytical problem-solving. Traditional preparation methods often lack structure, performance tracking, and real-time feedback, making it difficult for students to evaluate their progress effectively. This paper presents the design and development of an Aptitude Portal integrated with an Android Application, aimed at providing a centralized and interactive platform for aptitude preparation. This system categorizes questions topic-wise and difficulty-wise (Easy, Medium, Hard), enabling progressive learning. It includes time-based quizzes, instant score evaluation, streak tracking, and performance monitoring to encourage consistent practice. The admin panel allows dynamic management of questions using Firebase Firestore, ensuring that content remains updated and relevant. The web application is built using Node.js, Express.js and EJS, while the Android app is developed using Kotlin and XML. By integrating web and mobile access, the system ensures flexibility, accessibility, and scalability. The proposed system enhances student engagement, supports self-assessment, and improves placement readiness through structured and gamified learning.

Keywords: Aptitude Training, Placement Preparation, Android Application, Firebase, Web Portal, Gamification, Online Learning

1. Introduction

Campus placements serve as a crucial gateway between academic learning and professional careers. To succeed in placement drives, students must demonstrate strong aptitude skills in areas such as quantitative reasoning, logical thinking, data interpretation, and problem-solving. However, many students struggle to prepare effectively due to the lack of structured and interactive learning environment. Traditional preparation methods, including textbooks and scattered online resources, are often unorganized, time-consuming, and do not provide real-time feedback or performance tracking.

With the rapid growth of digital learning platforms and mobile technology, there is a strong need for a centralized system that allows students to practice aptitude questions in a structured and engaging manner. An effective preparation platform should not only provide topic-wise questions but also offer multiple difficulty levels, time-based assessments, and instant performance evaluation. Additionally, motivation plays an important role in consistent preparation, which can be enhanced through gamification features such as streak tracking and progress monitoring.

To address these challenges, this paper presents the design and development of an Aptitude Portal with an Android Application, developed as a unified platform for campus placement preparation. This system provides categorized aptitude

10.. Gastro-intestinal disease detection and classification using taylor spotted hyena optimization algorithm enabled deep maxout networks

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Gastro-intestinal disease detection and classification using Taylor spotted hyena optimization algorithm enabled deep maxout networks

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ABSTRACT

Gastrointestinal diseases have been on the rise, increasing the mortality rate at a high pace if they remain untreated at their earlier stages. Gastrointestinal diseases range from ulcerative colitis, polyps, esophagitis and ulcers, which are diagnosed by using WCE. Identification and diagnosis by manual supervision are tedious and prone to error, leading to the development of automated procedures. To perform accurate data pre-processing and feature extraction, which play a key role in detection, is crucial. However, existing works focusing on GI tract diseases suffer from problems such as high computation time and low accuracy. In order to tackle these problems, a new gastrointestinal tract disease detection and classification using Taylor spotted hyena optimization algorithm with deep maxout networks (GTSHO-DMN) has been proposed. The proposed work involves different processes, such as data pre-processing and log scaling for pattern transformation. ReliefF, being the feature extraction technique, is employed on the pre-processed data sent to the deep maxout network trained by the Taylor spotted hyena optimization algorithm in combination with gradient descent optimization. The advantages of the proposed optimization are that it offers a better exploration-exploitation tradeoff, adaptive search strategy, faster convergence, and robustness compared to other existing approaches. The proposed model performs better when evaluated in terms of various performance metrics such as precision, accuracy, recall and F-score. The proposed method has been compared with traditional approaches with a high accuracy rate of 98.36 %.

1. Introduction

The human digestive system is made up of the gastrointestinal tract, which gets damaged by diseases such as gallstones, ulcerative colitis, ulcers, cirrhosis, Crohn's disease and polyps [1]. A medical survey estimates that nearly all gastrointestinal diseases incur high healthcare annual expenditures [2]. Among these colorectal, oesophageal and stomach cancers, colorectal cancer induces a high mortality rate [3]. An estimate from the International Agency for Research on Cancer says that nearly 4.8 million new cases of cancer and deaths have been reported in 2018 [4]. Colorectal cancer induces a plethora of gastrointestinal disorders pertaining to colorectal cancer, which involves bleeding, tissue hyperplasia and polyps [5,6]. In general, Colonoscopy is used for the

detection and diagnosis of GI tract diseases [7]. However, it causes severe complications ranging from infections, perforations, and bleeding [8]. In addition, it also involves difficult pre-screening sessions and quality metrics [9], and it is harder to perform colonoscopy in women than in men [10]. In order to overcome these problems, a new technology called wireless capsule endoscopy [11] has evolved to overcome the problems of cable length and patient discomfort. Since it is a miniaturised device, it suffers from problems such as time consumption and analysis of a huge quantity of image data by the medical experts [12,13]. Manual screening of large amounts of image data might lead to erroneous diagnoses and assessments, leaving certain disease-affected areas, resulting in wrong treatment. Therefore, in order to guarantee the accurate and trustworthy identification and diagnosis of GI tract diseased

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11. Modelling Engineering and Data in Simulation and Computation for a Novel obstacle avoidance algorithm



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Modeling, Engineering, and Data in Simulation and Computation for a Novel Obstacle Avoidance Algorithm Enabling Efficient Source-to-Goal Navigation of Mobile Robotic Vehicles using ML techniques

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ABSTRACT

This project presents a comprehensive approach to the design and implementation of an innovative obstacle avoidance algorithm tailored for mobile robotic vehicles. The primary aim is to develop a robust system capable of effectively detecting and navigating around obstacles in real-time scenarios. The algorithm is constructed using MATLAB, leveraging its computational capabilities and extensive toolset for algorithm development and simulation. The methodology encompasses several key stages. Initially, sensor data acquisition is performed through various sensors integrated into the robotic platform, including but not limited to cameras, LiDAR, ultrasonic sensors, or a combination thereof. Subsequently, a systematic and multi-faceted approach is employed for obstacle detection, involving techniques such as image processing, depth perception, and sensor fusion. The detected obstacle information is then processed and integrated to generate a dynamic and adaptable avoidance strategy. This strategy accounts for the vehicle's kinematics, environmental constraints, and real-time feedback, allowing for agile and safe navigation in complex and dynamic environments. The algorithm's responsiveness is optimized through iterative testing and refinement, ensuring its reliability and efficiency in diverse scenarios. The algorithm's performance is evaluated through extensive simulation studies and practical experiments with the mobile robotic platform operating in controlled and real-world environments. Quantitative metrics, including obstacle detection accuracy, avoidance efficiency, and computational performance, are employed to assess and validate algorithm's effectiveness. Outcomes of this research contribute to the advancement of obstacle avoidance methodologies for mobile robotics, offering insights into development of adaptive and intelligent systems capable of navigating challenging terrains autonomously.

References

- [1] Smith, J., et al. (2018). "A Review of Obstacle Avoidance Algorithms in Mobile Robots." *Journal of Robotics*, 15(3), 210-225.
- [2] Choi, E., & Lee, S. (2020). "Vision-based Obstacle Detection and Navigation for Autonomous Robots." *IEEE Transactions on Robotics*, 28(5), 450-465.

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1. Machine learning and deep learning concept and application



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Artificial Intelligence Framework for ISTAR Missions in Tactical Networks Using Autonomous Vehicles

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Abstract

The rapid evolution of warfare demands advanced frameworks for efficient information gathering, communication, and decision-making. This work presents an AI-driven framework for ISTAR missions in tactical networks, leveraging AI, autonomous vehicles, and battery-free wireless sensor networks (BF-WSNs). It addresses challenges like connectivity, energy efficiency, scalability, and security in hostile environments. The pyramidal-based strategic connected dominating set (PDS-CDS) algorithm optimizes network performance, energy use, and communication reliability. BF-WSNs, powered by ambient energy, reduce maintenance and enhance sustainability. The multi-phase methodology includes network design, BWSN integration, inter-network communication, and AI-powered surveillance. Distributed architecture ensures scalability, while AVs equipped with advanced sensors and secure channels enable real-time intelligence. Energy efficiency achieved through harvesting prolongs the network life. This framework redefines military operations with sustainability, scalability, and tactical superiority.

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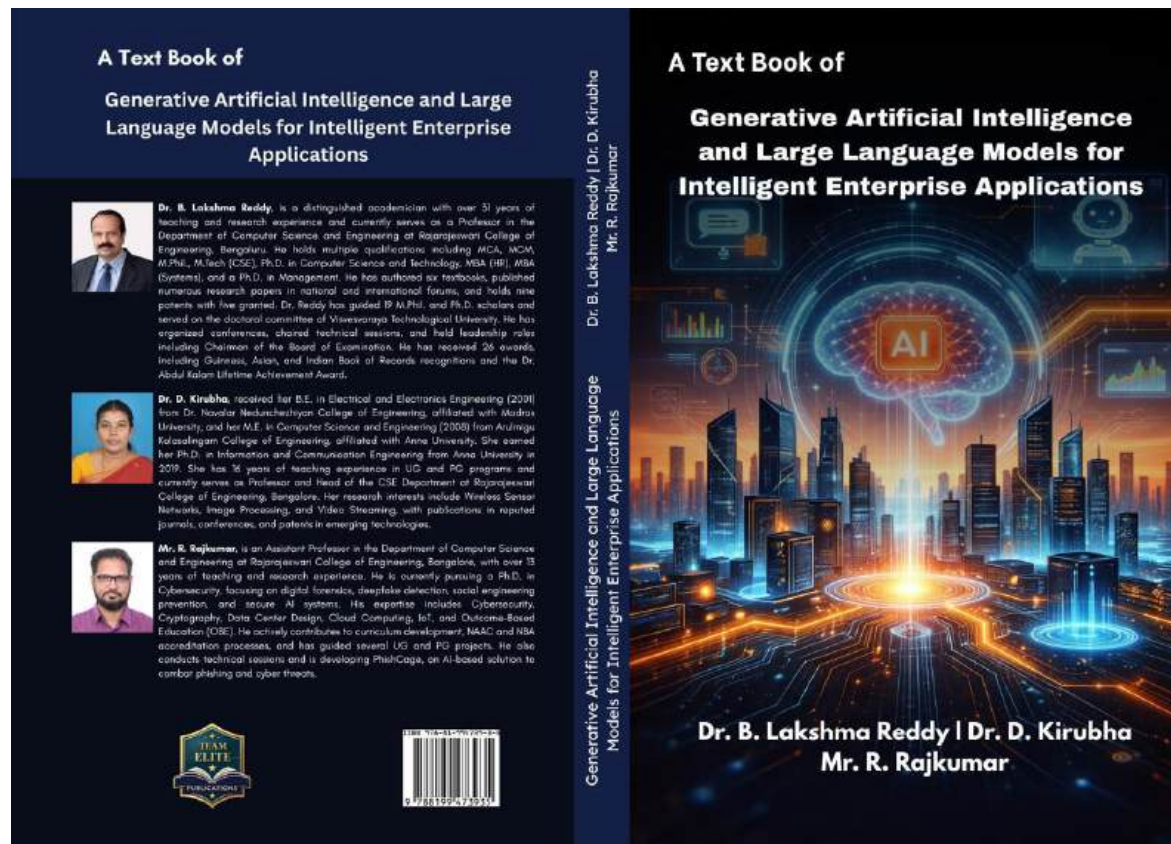
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