ICSTEM
30 April 2024

INTERNATIONAL CONFERENCE ON SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS 3.0 (ICSTEM-24)

30th April 2024

JANSONS Institute of Technology

DFTTI Design for test

Organised by

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in association with

DFT Training Institute Private Limited, Bengaluru

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PREFACE

The Third International Conference on Science, Technology, Engineering and Mathematics 3.0 (ICSTEM-24) is being organized by Jansons Institute of Technology, Coimbatore, India in Association with DFT Training Institute Private Limited (DFTTI), Bengaluru on the 30th April 2024.

The ICSTEM-24 was a notable event which brings Academicians, Researchers, Engineers, Industry Experts and Students together. The purpose of this conference is to discuss applications and development in area of “Science, Technology, Engineering and Mathematics” which were given international values by DFT Training Institute Private Limited (DFTTI).

The International Conference attracted over 150+ submissions. Through rigorous peer reviews 90+ high quality papers were recommended by the Committee. The Conference aptly focuses on the tools and techniques for the developments on Science, Technology, Engineering and Mathematics.

We are indebted to the efforts of all the reviewers who undoubtedly have raised the quality of the proceedings. We are earnestly thankful to all the authors who have contributed their research works to the conference. We thank our Management for their wholehearted support and encouragement. We thank our principal for his continuous guidance. We are also thankful for the cooperative advice from our Advisory Chairs and Co-Chairs. We thank all the members of our local Organizing Committee, National and International Advisory Committees

About ICSTEM

The recent advancements in the domains like Science, Technology, Engineering and Mathematics have led to exponential growth in different sectors like Advancements in manufacturing and optimization techniques, New product design and development, Renewable energy, Smart grid, Internet of Things, Big data, Embedded Technologies, Industrial Automation, Robotics, Structures & Construction, Remote Sensing & GIS Applications etc. The energy efficient green technologies are explored for improved deliverables in various sectors with cost effective solutions.

This conference aims at knowledge sharing among academicians, researchers and experts from related industries on a common forum, for exploration on emerging technologies and innovations in Engineering and Science for better Engineering solutions. This conference will act as a platform for researchers to present their research findings and outcomes. Practicing engineers, Academicians of various Universities and Engineering institutions, scientists from R&D institutions, research scholars and post graduate students from all over the globe are invited to participate in this conference. The conference will be conducted in virtual mode (JiTeEDU) at Jansons Institute of Technology, Coimbatore, India.

All submitted papers will be peer reviewed. All original papers will be verified for plagiarism. Both academia and industries are invited to submit their papers highlighting the state-of-art research and developments. The technical program of the Conference will include keynote speeches and regular technical sessions.

This conference is expected to change the life of rural masses, thereby contributing to the inclusive growth of the country. The conference also provides new research ideas to young researchers and entrepreneurs around the world, generating new jobs in engineering sector. Also it provides intense sharing of knowledge in various domains in the emerging field of Science and engineering. In addition to it, this gathering will help the delegates to establish new research avenues in the above fields providing a roadmap to choose new research problems

Objectives

The conference aims to bring together the leading Academicians, Scientists, Researchers and Research Scholars to exchange and share their experiences and research results over all aspects of Communication, Computing and Industrial Engineering towards sustainable development. The conference aims to convene the experts from various domains to enhance the knowledge about innovative technologies and present new research findings to promote global scientific and community collaborations in synergy with other Professional Associations.

Environmental Responsibility, Economic Efficiency, Social Solidarity, Digital Transformations are the avenues as well as needs of modern business sectors. The achievement of the desired sustainable development with the help of digital transformation seems to be impractical without raising good critical thinkers and skillful agents of sustainable future. The conference aims to facilitate pursuing the sustainable development through the Digital Transformation, Innovations and modernized technologies of the related systems and structures that will consequently support people to be active contributors to more peaceful and sustainable societies and develop a sense of responsibility for our Planet.

- Benefits To Delegates Attending The Conference: (Authors Benefits):
- Conference proceedings with ISBN publication
- Opportunity to publish their article in high impact factor journals
- Recommendations and comments for best paper award
- Expected Outcomes of Conference
- Original research work/findings will be published
- A platform for the researchers to explore their expertise
- Appreciation and Recognition for their work.

About DFTTI

DFTTI is a multidisciplinary professional organization focused on fostering research and development in science, engineering, and technology. It is recognized for its contributions to technical innovation and advancement in these fields. The organization comprises professional experts and technical leaders from around the world. DFTTI is committed to enhancing the domains of science, engineering, and technology through various initiatives.

DFTTI is a prominent publisher of research papers in high-quality, peer-reviewed journals and maintains a research magazine. It offers ample opportunities for research and development to talented individuals and experts in engineering by providing financial assistance, thus eliminating economic barriers to technical growth and research development.

Furthermore, the organization benefits from its International Advisory Board (IAB), which includes intellectuals not only from a particular region but also from diverse geographical areas. This diverse advisory board enhances the organization's global reach and expertise, contributing to its overall effectiveness and success. DFTTI offers wide range of educational and professional development offerins such as:

- Certified Courses (VLSI – DFT, Design & Verification, Verilog HDL, Software)
- Corporate Training for Industry persons
- Internships, Student projects [Engg/ArtsScience]
- International Conferences and Journal Publications
- Guest Lectures/Workshops/Seminars/Webinars
- Value Added Courses, One Credit Courses
- Skill Development Programs (MSME)
- FDP (Faculty Development Program)
- Industry – Institution Interaction
- Soft skill Training

Key features include a robust curriculum covering DFT concepts, hands-on labs with industry-standard tools, expert faculty, industry collaboration, modern infrastructure, flexible training formats, certification programs, continuous learning opportunities, career services, research support, global reach, and quality assurance measures. By providing high-quality training and resources, such institutes prepare students and professionals for successful careers in the semiconductor industry.

About JIT

Jansons Institute of Technology is promoted by the Jansons Business Group, major with a Textile, significant presence in Granites and Health Care. The Board of Jansons Business Group is chaired by Rtn. MPHF Shri T.S. Natarajan. The Chairman is ably assisted by Vice Chairmen Shri T.N. Kalaimani and Shri T.N. Thirukumar. Jansons Institute of Technology is established in the year 2009. Jansons Institute of Technology is the second educational venture by Jansons Business Group.

Jansons Institute of Technology is approved by All India Council for Technical Education (AICTE), New Delhi, accredited by NAAC with "A" Grade and affiliated to Anna University, Chennai. With profound insight into the resource requirements of the higher education system, JIT has proudly set up a world class infrastructure complemented with intellectual capital in the form of high competent and experienced team of faculty. Many of the facilities are way beyond the regulatory requirements aiming for learning beyond the syllabus to address the requirements of the industry. These material facilities along with value addition programs and student support systems are the integral facets of empowerment at JIT.

Jansons Institute of Technology offers Bachelors Degree Programmes in the branches of Artificial Intelligence & Data Science, Civil Engineering, Computer Science and Engineering, Electronics and Communication Engineering and Mechanical Engineering in its most modern state-of-the-art campus on the Coimbatore-Chennai National Highway.

Eleven Batches of students were passed out with good Academic, Co-Curricular and Extracurricular achievements till the academic year 2022-2023. Teaching and Learning process at JIT is taken care by a set of learned, committed and well experienced faculty members. There are 25 faculty members with Ph.D. qualification and 18 faculty members are pursuing their doctoral degree in the Institution.

Jansons Institute of Technology certified for maintaining the Quality Management System with ISO 9001:2015 Certification by TUV SUD, Germany. The Institution has commenced the process for NBA Accreditation. Effective implementation of quality control processes ensures Engineering graduates with the expected level of knowledge, skill, and attitude. JIT also offers an extensive range of resources, opportunities and services to the outcome based teaching learning process.

JIT received funds for conducting Conferences /Seminars and Technical workshops from DST, IEEE MGA India Strategic Initiative-USA, IEEE Madras Section, IEEE MAS Young Professionals Affinity Group, Indian Council for Medical Research (ICMR), Indian National Science Academy (INSA) and National Board for Higher Mathematics (NBHM), Department of Atomic Energy. JIT conducted IEEE Coimbatore Hub Congress totally funded by IEEE MGA India.

Strategic Initiatives and IEEE Madras Section in the month of July 2016. Apart from these, various proposals were sent to various national funding agencies across the country for Research project, organizing seminar, workshop, conference etc.

JIT is having a very active Centre for Corporate Relationship. The training offered to the students are very unique which involves training for Technical Aptitude, Programming, Attitudinal tuning-up, General aptitude, Group Discussions, Technical Interview, Personality development, Personal Interview, Psychometry tests etc.

JIT has "Industry-Academia" collaboration with leading Industries and has active 18 MoUs and few are as follows. Huawei Services (Hong Kong) Co. Limited, Bosch Limited Siemens, CoE-NIT Sparkout tech. Solutions Pvt. Ltd., Draup Business Solutions Pvt. Ltd., Zinnov Management Factana Computing Pvt. Ltd, COINDIA, ICTACT, INFOSYS, TCS.

Rtn. MPHF. Shri. T. S. Natarajan
Chairman
Jansons Institute of Technology, Coimbatore, India

Chairman'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

Mere transferring of information is not what is expected from an educational institution. Every student comes with myriad qualities and infinite potential. To channel those strengths into positive avenues is what is expected from educators. Along with this, there is the uniquely invisible trait present in students – this astounding attribute called Character. It is the bounden duty of places of learning to provide enough challenges so that the character of students is finely landscaped, in addition to delivering the required knowledge characteristics that make up an engineering graduate. This is the Holistic Learning envisaged at JIT.

Best Wishes...!!

Shri. T. N. Kalaimani
Vice-Chairman
Jansons Institute of Technology, Coimbatore, India

Vice Chairman's Message

"Develop a passion for learning. If you do, you will never cease to grow."

- Anthony J. D'Angelo

When we love what we do, we seem to lose track of the passage of time. Such must be the aim of the teaching and student community. Let not subtle distractions keep one from moving full-throttle towards one's goal – in this case, pursuing an engineering degree that is to your liking. Give it your complete attention, and be willing to spend your time and energy on this pursuit. If you passionately go after your goal, learning will be a joyous and fulfilling experience here.

Best Wishes...!!

Shri. T. N. Thirukumar
Vice-Chairman
Jansons Institute of Technology, Coimbatore, India

Vice Chairman's Message

"Develop a passion for learning. If you do, you will never cease to grow."

- Anthony J. D'Angelo

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Best Wishes...!!

Dr. Murugeswaran Surulivel
Founder
DFT Training Institute Private Limited, Bengaluru, India

Message

Collaboration allows teachers to capture each other's fund of collective intelligence."

- Mike Schmoker

On behalf of DFTTI, Bengaluru and the organizing committee, I extend my sincere gratitude to all of you for your invaluable contributions to the success of the International Conference on Science, Technology, Engineering, and Mathematics 3.0 (ICSTEM-2024).

Your dedication, enthusiasm, and expertise made ICSTEM-2024 a truly enriching and enlightening experience for all involved. The exchange of ideas, discussions, and insights shared during the conference have undoubtedly contributed to the advancement of knowledge in our respective fields.

We are grateful for your active participation, insightful presentations, and meaningful interactions throughout the event. Your contributions have not only enhanced the quality of the conference but also fostered collaboration and networking among the global community of researchers, scholars, and practitioners in science, technology, engineering, and mathematics.

We sincerely appreciate your commitment to academic excellence and your willingness to share your research findings and expertise with your peers. Your passion for innovation and your dedication to pushing the boundaries of knowledge inspire us all.

Once again, thank you for making ICSTEM-2024 a resounding success. We look forward to your continued involvement and participation in future endeavors aimed at advancing science, technology, engineering, and mathematics for the betterment of society.

Mr. Venkadesan Perumal
Director of Engineering
Netskope, California, United States

About Keynote Speaker

Mr. Venkatesan Perumal, a seasoned leader with over 19 years of hands-on experience in various critical domains of the technology industry. With a strong technical background and a track record of successful project deliveries, our guest brings a wealth of knowledge and expertise to the table.

As an Experienced Manager, he has led highly-talented teams of engineers and managers, overseeing a team size of 25 individuals. Their expertise spans across multiple areas including Quality Assurance (QA), Automation, DevOps, Site Reliability Engineering (SRE), and Customer Escalation (L3-L4), demonstrating a deep understanding of organizational processes and strategies necessary for successful project outcomes.

One of the standout specialties of our guest lies in Networking, with proficiency in SD-WAN, Switching, Routing (including protocols like BGP, OSPF), TCP/IP fundamentals, Firewall configurations, Load Balancing techniques, IPSec, and Layer 7 protocols. This comprehensive understanding of networking technologies underscores their ability to architect robust and resilient network infrastructures.

Furthermore, our guest possesses a strong command over Cloud technologies, boasting expertise across major cloud platforms such as AWS, Azure, and GCP, as well as virtualization technologies like VMware ESXi and KVM. Their familiarity with Software Defined Networking (SDN) principles and Security Technologies adds another layer of depth to their technical repertoire.

In terms of tools and methodologies, he is well-versed in a wide array of industry-standard tools including IXIA and Spirent for network testing, as well as a variety of Linux-based open-source tools for automation and infrastructure management. He has proven track record in implementing Continuous Integration/Continuous Deployment (CI/CD) pipelines using tools such as Github, Docker, Kubernetes, Jenkins, and Ansible, among others.

Mr. Mahesh Chandran
Manager - ATE Test
Insemi Technologies Private Limited, Bengaluru, India

About Keynote Speaker

Mahesh Chandran is an accomplished semiconductor professional with extensive experience in ATE (Automated Test Equipment) testing and validation across various prestigious companies. Currently serving as the Manager-ATE Test at Insemi Technologies Pvt Ltd, Mahesh leads a team of adept engineers, driving forward new silicon bring-up activities and ensuring the highest standards in hardware validation. His proficiency in ATE Load board design and program development, particularly within the V93K ATE Test system, underscores his commitment to excellence in every aspect of his work.

Prior to his current role, Mahesh held pivotal positions at globally renowned companies such as Cisco Systems, UST Global Singapore, and Western Digital. From spearheading advanced automotive micro-controller products burn-in and stress tests to collaborating closely with international design teams in the USA, Germany, and Japan, Mahesh's contributions have been instrumental in shaping the landscape of semiconductor testing.

Additionally, he held positions at SICON Design Technologies Pvt. Ltd. and Chiptest Engineering Limited as an ATE Test Engineer, further honing his skills in semiconductor product testing. His career trajectory showcases his proficiency in semiconductor testing methodologies and his ability to lead teams in ensuring product quality and reliability.

Mahesh's expertise extends beyond technical proficiency, he possesses a deep understanding of the entire semiconductor product testing lifecycle. His experience in working with cutting-edge technologies and innovative products has positioned him as a thought leader in the industry.

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A Systematic Approach to Enhance the Properties of Concrete with Copper Slag, Sugar Bagasse & Fly Ash - Synergistic Blend - Synergistic Blend

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Abstract:

The disposal of copper slag, a byproduct of industrial processes, poses a significant challenge for industry stakeholders due to the absence of efficient disposal methods. Its inherent properties make disposal particularly challenging, exacerbating the issue. However, despite these challenges, copper slag holds promise for integration into construction practices, thanks to its unique characteristics. This project endeavors to harness the potential of copper slag in construction while addressing its propensity to cause cracking. To tackle this challenge, the project proposes the use of sugar bagasse as a means to mitigate the reactive nature of copper slag, thereby reducing its tendency to induce cracking in concrete. Additionally, fly ash is incorporated as a complementary component. The overarching objective is to develop a "synergistic blend" of these three materials, aiming to enhance the performance of concrete and revolutionize conventional construction practices. While previous research has explored the individual use of copper slag and sugar bagasse in concrete, this project's innovation lies in their combined integration. By synergistically blending these three distinct materials, the project aims to optimize concrete performance, addressing both durability and environmental concerns. The project's title, "SYNERGISTIC BLEND," aptly encapsulates its focus on combining diverse elements for enhanced outcomes. The process of creating this concrete follows conventional methods, including material selection, mixing according to a prepared design, and comprehensive testing of both fresh and hardened properties. The test results inform the final mix design, ensuring the concrete meets the necessary standards for construction applications. Through meticulous experimentation and analysis, this project aims to contribute to the advancement of sustainable and resilient construction practices

Keywords:

Copper Slag, Fly Ash, Synergistic Blend, Sugar Bagasse Ash, Revolutionize

An Experimental Approach on Dye Effluent Contaminated Soil with Electro Kinetic Remediation Process

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Abstract:
This study presents an experimental investigation into the remediation of soil contaminated with dye effluents using electro kinetic processes. Dye effluent contamination in soil is a pressing environmental issue, requiring effective remediation techniques to mitigate its adverse effects. The experimental approach involves the application of electro kinetic remediation, a promising technique that utilizes electrical currents to facilitate the movement of contaminants through the soil matrix. In this experimental approach the clay soil is artificially contaminated with 10%, 20% and 30% dye effluent. Through a series of controlled laboratory experiments, the efficacy of electro kinetic remediation in removing dye pollutants from soil is assessed. The parameters like Liquid limit, plastic limit, shrinkage limit, proctor compaction test and unconfined compression test were studied before and after the remediation process. Results indicate significant reductions in dye effluent concentrations within the soil matrix following electro kinetic treatment. The findings of this experimental study contribute to the advancement of electro kinetic remediation as a sustainable and efficient method for the remediation of soil contaminated with dye effluents, offering valuable guidance for environmental remediation efforts.

Keywords:

Soil Contamination, Electro Kinetic, Dye, Effluent. Atterbergs, Strength, Remediation, Environment, Pollution

Experimental Investigation on Sustainable Brick By Partially Replacement of Foundry Sand and Rice Husk with Conventional M-Sand

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Abstract:

The project aims to develop sustainable bricks by partially substituting Foundry sand and Rice Husk with Conventionally M-sand in different ratios to examine their robustness. The parameter, which includes water absorption, efflorescence, and compressive strength, are carefully examined to investigate whether Rice husk bricks are more appropriate than conventional bricks. Leveraging waste materials to create sustainable alternatives is a growing focus of the worldwide imperative for eco-friendly and sustainable disciplines. This change emphasizes how vital it is to address resource depletion-related issues by utilizing engineering skills. This study investigates to obtain the High Performance-Sustainable Bricks. From the literature survey we observed various potential benefits obtained by usage of Rice husk & Foundry Sand. Research findings suggest a positive correlation between replacing foundry sand with Conventional one for increase the compressive strength. This project emphases partially substituting difference percentages of rice husk ash & Foundry sand to attain the difference classes of bricks. The high silica content present in Foundry sands achieve to attain high performance bricks. Through material characterization, compatibility test improvement assessment aim to evaluate the optimized replacement ratio. This research seeks to contribute by usage industrial wastes (Rice husk & Foundry Sand) which leads to reducing landfill disposal methods and also achieved to Produce Robust-Sustainable Bricks.

Keywords:

Rice Husk, Foundry sand

Investigation on Sandwiched Wall Panel with Lightweight Concrete Using Bloated Clay

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Abstract:

In recent days tall buildings were mostly preferred which leads to increase the member size, steel quantity and volume of concrete, which leads uneconomical condition. To refrain the uneconomic factor we require constructing light weight structure with proper robust. The present investigations are carried out to develop a simple, lightweight and cost effective technology for replacing the existing wall systems. So that here going to use Bloated Clay in producing the lightweight concrete. Bloated Clay are used as a replacement to the coarse aggregates. The Bloated Clay was partially replaced in place of coarse aggregates by 0, 30%, 35%, 40% and 45%. M30 grade of concrete was designed and tested for various sandwich panel. The mix designs for different types of mixes were prepared by replacing the coarse aggregates at different percentages of Bloated Clay aggregate. Experimental investigations like workability, Compressive strength test, split tensile strength test, Flexural strength test for Cube, Panel, cylinder & prism different concrete mixes with different percentages of Bloated Clay aggregate after 7, 14 and 28-days curing period has done. It has been observed that the workability increases with increase in the percentage of replacement of Bloated Clay aggregate increases. From the review from the literature the strength of concrete also increases with the Bloated Clay aggregate up to 35% percentage.

Key words :

Bloated Clay, Tensile strength

Stabilization of Black Cotton Soil by Using Lime and Bagasse Ash

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Abstract :

The practice of altering soil characteristics to increase strength and durability is known as soil stabilization. It is the process of modifying foundation soil to confirm desired properties or to increase the compressive strength of a less stable soil. By strengthening the soil's shear strength and managing its shrink-swell characteristics, it enhances a subgrade's ability to support foundations and pavements. The enhancement of the soil raises its overall performance, tensile strength, and bearing capacity. Numerous chemicals are used to achieve the soil stabilization process. Chemical stabilization is a frequently employed technique for enhancing engineering qualities in difficult soils. Lime has been employed as a chemical stabilizer for the past few decades. Right now Utilizing waste materials as soil stabilizers is becoming more popular in this day of resource depletion and energy use. The burned byproduct of sugarcane bagasse, which has a high silica content, is sugarcane bagasse ash. This pozzolanic substance, sugarcane bagasse ash, has the potential to be applied as a soil stabilizer. This experiment assesses and contrasts the potential of sugarcane bagasse ash with lime's stabilizing efficiency. The sieve analysis test, specific gravity, liquid limit, plastic limit, compaction factor, and free swell index tests were among the experiments we performed for "Stabilization of Black Cotton Soil by Using Lime and Bagasse Ash."

Keywords:

Bagasse powder, Foam, Sand, Concrete cube, Additives, Mechanical properties, Sustainability, Waste reduction, Thermal insulation, Eco-friendliness

Investigation in Fibre Treatment on Morphology and Mechanical Behaviour of Hibiscus Cannabinus / Curaua /Epoxy Resin with Nano Particles for Bio – Medical Applications

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Abstract:

Kenaf fiber and PALF (pineapple leaf) has wide applications in automobile industry we are trying to apply in biomedical sector such as (socket limbs) in order to achieve superior result for prosthetic limbs on untreated hybrid composite can provide mechanical properties, i.e., tensile strength, comparable to those of synthetic fiber with lower density than traditional materials, resulting in lightweight and eco-friendly polymer composites. In order to achieve high strength and adequate load transmission, stability and control, we have mixed nano particles such as Porcelain ceramic, granite powder. Epoxies are used primarily for fabricating high-performance composites with superior mechanical properties, resistance to corrosive liquids and environments, superior electrical properties. Scanning electron microscopy (SEM) was used to observe the fracture surfaces of the tensile testing samples. The microstructure of the 70%Kenaf hybrid composite showed good interfacial bonding and the addition of Kenaf improved the interfacial strength. It has been concluded that the 30% of Palf and 70% of Kenaf ratio allowed obtaining materials with better mechanical properties (tensile, flexural compression and impact strengths) in palf and kenaf composites. The results obtained in this study will be used for further comparative study of untreated hybrid composites with treated hybrid composites.

Keywords:

Kenaf &Palf fiber, Epoxy resin, Porcelain Ceramic & Granite Powder (Nano particles)

Development of IoT-based system to monitor and regulate oil quality parameters in real-time industrial applications

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Abstract:

Industrial processes rely heavily on maintaining optimal oil quality. Traditional methods for monitoring oil quality are often manual and labor-intensive. This article proposes an Internet of Things (IoT) system designed for real-time monitoring and regulation of oil quality parameters. The system utilizes sensors to gather data on critical oil properties, such as temperature, viscosity, and acidity. This data is then transmitted wirelessly to a cloud platform for analysis. Machine learning algorithms can be employed to recognize trends and predict potential issues with oil quality. Based on the analysis, the system can automatically trigger control mechanisms to regulate oil parameters and maintain them within the desired range. This real-time monitoring and control approach can ensure efficient oil usage, minimize downtime, and extend equipment lifespan in industrial settings.

Keywords:

IoT, oil quality, real-time monitoring, industrial applications, edge computing, sensors, data collection, environmental sustainability

Efficient Solar Cold Storage for Horticultural Produce for Small Scale Farmers

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Abstract:

Advancements in agricultural storage technology play a pivotal role in ensuring food security and reducing post-harvest losses. This study presents a comprehensive exploration of a novel agricultural storage container designed to maintain precise temperature control for a diverse range of products, integrating both cold and hot storage capabilities. At the heart of this innovative solution lies a focus on sustainability, achieved through the strategic use of recycled polymers and biodegradable composites in the construction of the container. These materials not only offer exceptional thermal insulation properties but also contribute to the reduction of environmental impact by repurposing waste materials. The container's modular design allows for scalability and ease of assembly, ensuring adaptability to varying storage needs across different agricultural contexts. A key feature distinguishing this container is the integration of solar technology, which enhances its efficiency and sustainability. Solar panels installed on the exterior surface of the container harness renewable energy from sunlight, powering the temperature control system and other operational components. This self-sustaining energy system reduces reliance on conventional energy sources, making the container suitable for deployment in remote or off-grid locations where access to electricity may be limited. The container's insulation properties are optimized through advanced design techniques, minimizing heat transfer through the walls and ensuring a stable internal environment conducive to the preservation of product quality and freshness. By maintaining both cold and hot temperatures as required, the container offers a versatile storage solution suitable for a wide range of agricultural products, including fruits, vegetables, dairy, and meat. The integration of solar technology not only improves the efficiency of the container but also offers significant benefits to the agro-industry. Reduced operational costs, achieved through lower energy consumption and minimal reliance on external power sources, contribute to greater profitability and economic stability for farmers. Furthermore, the ability to store agricultural products in optimal conditions regardless of location enhances marketability and expands market reach, enabling farmers to capitalize on opportunities for increased sales and access higher-value markets. Its potential to revolutionize agricultural practices and contribute to a more sustainable future for farmers and consumers underscores its importance as a pioneering solution in the field of agricultural storage.

Keywords:

Food security, solar panels, versatile storage

Formability Study on Thin Sheet Metals

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Abstract:

Thin sheet metals play a pivotal role across diverse industrial sectors, owing to their versatility in assuming various shapes. Industries such as electronics, aerospace, and automotive heavily rely on these materials. This study provides an extensive examination of recent advancements and methodologies in researching the formability of thin sheet metals. It delves into the multifaceted factors impacting their formability, encompassing material attributes and the intricacies of forming processes. The study employs experimental validation to assess the formability of weld structures, ensuring compliance with specified standards. The main aim is investigation the effect of weld zone orientation on forming limit diagram (FLD) of the weld using experimental and finite element model. The results showed that the thinner part of weld dominated the majority of deformation similar to the FLD of the parent metal. The effects of different welding orientations on the forming performance of weld were examined from the failure analysis.

Keywords:

Thin sheet metal, Welding, Forming, Failure Analysis

Portable Waste Paper Recycling Machine for Sustainable Clean Environment

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Abstract:

Paper is a versatile material made from cellulose fibers, typically derived from wood pulp and it's one of the most widely used materials globally, serving purposes ranging from writing and printing to packaging and hygiene products. Paper waste refers to the disposal or inefficient use of paper products, resulting in environmental and economic impacts. Paper recycling is the process of converting used paper products into new paper materials. It's an essential part of waste management and environmental conservation efforts, as it helps reduce the demand for virgin wood pulp, conserves natural resources, and minimizes the environmental impact of paper production. A portable waste paper recycling machine could be a game-changer for promoting sustainability and environmental consciousness, especially in areas where recycling infrastructure is limited or nonexistent. Such machines could make it easier for communities, businesses, and individuals to recycle paper waste effectively, reducing the amount of paper ending up in landfills and conserving resources. This study is focuses on design and fabricate a waste paper recycling machine to produce the essential paper-based product and also to reduce processing time with production costs by using appropriate engineering components without compromising the machine's efficiency and man power. These machines play a crucial role in the paper recycling process by converting collected waste paper into pulp, which can then be used to manufacture various types of paper by addition of suitable binders during the slurry preparation. This study on paper recycling machines fabrication could encompass various aspects, including technological advancements, process optimization, economic feasibility, environmental impact assessment with market analysis.

Keywords:

Paper waste, Recycling machine, Plup, Binders

Design and Development of a Smart Safety System for Flyovers

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Abstract:

Due to increasing and expansion of production of logistics the transportation becomes one of the main support in country. Due to this the accidents caused by height vehicles become a serious issue. The aim of the project is to provide a solution for this problem and to reduce the accidents/collisions of vehicles over height that crosses bridges or flyovers . The vehicle driver will be notified by smart solution about its vehicle status. This system is mainly based on the Smart alarming solution to minimizing the number of accidents and its effect. Also by using this system we can detect the accident and evaluate a proposed solution.

Keywords:

Accident, Solution, IOT, Detect, Vehicles

Solar Air Cooler and Heater with Auto Tracking

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Abstract:

The new developments and requirements inspired us to think of new improvements in air conditioning Engineering field. Nowadays heater as well as cooler is available in market separately. Hence we decided to take over both applications in a same system. It's a new step ahead in air conditioning Engineering field. The system consists of solar panels, a tracking mechanism, an air cooling unit, and a heating element. The solar panels are mounted on a tracking platform that continuously adjusts their orientation to maximize solar exposure. This ensures maximum energy generation, enhancing the overall efficiency of the system. The air cooling unit utilizes the generated solar energy to power a compressor and fans, providing cool air circulation. During colder periods, the heating element is activated, using the stored solar energy to warm the air. The system incorporates intelligent control algorithms to optimize energy usage based on ambient conditions and user preferences. Key benefits of this system include reduced energy costs, environmental sustainability, and improved comfort in both hot and cold climates. The auto-tracking feature eliminates the need for manual adjustments, making the system user-friendly and efficient. Solar electricity is the technology of converting sunlight directly in to electricity. It is based on photo-voltaic or solar modules, which are very reliable and do not require any fuel or servicing. Solar electric systems are suitable for plenty of sun and are ideal when there is no main electricity.)

Keywords:

Solar, Air Cooler and Heater, Auto Tracking, Energy

Development of Solar Multipurpose Agricultural Vehicle

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Abstract:

The advancement of technology has led to innovative solutions in agriculture, aiming for increased efficiency and reduced manual labor. In this context, the design and fabrication of a Bluetooth-controlled solar multiple agricultural vehicle offer a promising approach. This vehicle integrates multiple functionalities including weed remover, seed sowing, water spraying, and grass cutting, enhancing agricultural operations. The core design features a robust chassis equipped with solar panels for sustainable energy generation, ensuring autonomy and eco-friendliness. Bluetooth technology enables remote control and monitoring, providing farmers with real-time data and operational flexibility. The weed remover mechanism incorporates precision sensors and actuators to target and eliminate weeds selectively, minimizing crop damage. For seed sowing, the vehicle employs an automated dispensing system with adjustable seeding rates, optimizing seed distribution and enhancing crop yield. Water spraying functionality utilizes efficient nozzles and water management systems, ensuring precise and uniform irrigation across fields. Additionally, the grass cutter mechanism integrates sharp blades and safety features for efficient grass cutting while maintaining operator safety. The integration of these functionalities into a single vehicle streamlines agricultural tasks, reduces labor costs, and improves overall productivity. The Bluetooth control enhances usability and enables seamless integration with existing farm management systems. Overall, the design and fabrication of this Bluetooth-controlled solar multiple agricultural vehicle represent a significant advancement in modern agriculture, promising enhanced sustainability and efficiency for farmers.

Keywords:

Bluetooth, solar panel, weed remover, water spray, agriculture

Optimisation of EDM Parameters on Machining Magnesium Alloy AZ31B for Improving Circularity, Cylindricity and Perpendicularity

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Abstract:

Magnesium Alloy AZ31B are advanced material having the properties of strength, ductility, light weight and low density. Since the materials can be machined by non-conventional machining process by using electrical discharge machining method. The current (I), pulse on time (Ton), pulse off time (Toff) and dielectric flushing pressure (DP) are considered sparking parameters for the machining of a Magnesium Alloy AZ31B. Taguchi's orthogonal array (OA), L9, has been used to design the experiments. The optimal machining inputs are determined by the grey relational grade (GRG), which is attained from the grey relation analysis (GRA) for various response characteristics, such as the material removal rate (MRR), tool wear rate (TWR), circularity (CIR), cylindricity (CYL) and perpendicularity (PER). The results were validated by the confirmation tests. Thus the machining parameter for electric discharge machine was optimized to achieve higher material removal rate and lower rate on electrode. The result shows that the proposed technique is being effective to optimize the machining parameter for electric discharge machining process.

Keywords:

EDM; MRR; TWR; CMM; Circularity; Cylindricity; Perpendicularity; DOE; GRA

Development of Energy Efficient Jet Impingement Evacuated Tube Solar Air Heater assisted dryers for dehydration of Waterhyacinth

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Abstract:

In the pursuit of sustainable development, an innovative solar greenhouse dryer, coupled with a solar air heating system, emerges as a symbol of eco-friendly progress. This technology, conceived with a commitment to longevity and environmental stewardship, introduces a novel element—an integrated jet impingement evacuated tube solar air heating system. Located in the vast plains of India, this dryer aims to achieve optimal drying temperatures for a waterhyacinth. The study conducts theoretical analysis, delving into the interplay of design factors in a collector, navigating the complexities of thermal dynamics. The optimal parameters, as revealed by simulation results, consist of 20 tubes with dimensions of 1.8m length and outer/inner diameters of 58/47mm.The advanced dryer undergoes rigorous testing in a laboratory, exploring both batch and semi-continuous modes, with onions as the focal point. Impinging jet solar air heater breaks the laminar sublayer formulation increases the performance by 18 to 23%..Effective integration of novel solar air heater with green house drier, have space reduction by 32%,reduction in drying time by 26 to 40% and Production cost by 28% and ensures the quality of the product.

Keywords:

Sustainable Development, Innovative Solar Greenhouse Dryer, Solar Air Heating System, Eco-Friendly Progress, Jet Impingement Evacuated Tube, Waterhyacinth, Green House Drier

Design and analysis of differential drive wheeled mobile robot for all kinds of environment

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Abstract:
This project report describes the design, development, and testing of a differential drive mobile robot designed primarily for all kinds of environment like warehouses, hospitals etc. The major goal of the project is to develop a mobile robot capable of traversing stairs and all kinds of surfaces along with loads carrying. Since there is a huge scope of research in mobile robots, this project gives a start to the path in the search. The robot system is designed for various applications, including surveillance, inspection, and transportation. The robot consists of two driving wheels, a caster wheel, a differential drive mechanism, a frame, and a control system. The design process involved the selection of appropriate materials, the creation of 3D models, and the simulation of the system's performance under various loads and conditions. The differential drive mechanism allows the robot to move in any direction, making it highly maneuverable and suitable for various applications. The analysis of the system involved the calculation of various mechanical properties, such as stress, strain, and deflection, under different loading conditions. The results of the analysis showed that the robot system can withstand the required loads and operate efficiently in various environments. The project report concludes with a discussion of the design and analysis process, the results, and potential future improvements. Overall, the project demonstrates the potential of SolidWorks software in designing and analysing complex mechanical systems, such as differential drive wheeled mobile robots. The robot's control system was designed using Arduino microcontroller and motor driver. The control system allows for the robot to be remotely controlled and to follow a pre-defined path. The robot was tested in various scenarios, including straight-line motion, turning, and obstacle avoidance. The testing showed that the robot could operate efficiently and effectively in various environments. In conclusion, the project demonstrates the potential of SolidWorks software in designing and analysing complex mechanical systems, such as differential drive wheeled mobile robots. The robot's design and performance can be improved by adding sensors for obstacle detection and avoidance, increasing the payload capacity, and improving the battery life. The robot can be used in various applications, including surveillance, inspection, and transportation.

Keywords:
Differential Drive Mechanism, Warehouse Management, Maneuverability, Automation, Logistics, Robotics.

IoT and Block Chain Based Distributed Agriculture System to Assist Smart Farming and Track Authenticity of Food Source

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Abstract:

In many countries, farmers persist with traditional farming methods, resulting in inefficiencies such as input wastage and low yields due to inaccurate fertilizer application based on soil analysis and crop yield. Despite the rapid advancement of technology, many individuals overlook the significance of securing their food chain, while others feel powerless to effect change due to lack of awareness. To address these challenges, the implementation of smart farming utilizing IoT (Internet of Things) and a Block chain-based distributed agriculture system emerges as a promising solution. This integrated approach leverages IoT sensors to gather real-time data on soil conditions, crop growth, and environmental factors, enabling precise and timely decision-making. By employing Block chain technology, data transparency, traceability, and integrity are ensured across the agricultural supply chain, from farm to fork. Through smart contracts, stakeholders can automate transactions, streamline processes, and establish trust among participants. Furthermore, by analyzing vast amounts of data collected through IoT devices, farmers can optimize resource usage, minimize waste, and enhance productivity. This holistic approach not only empowers farmers with actionable insights but also fosters sustainability and resilience within the agricultural sector. Embracing smart farming practices not only addresses current challenges but also lays the foundation for a more secure and efficient food ecosystem in the future.

Keywords:

Empowering , Holistic , Enhance , Embracing , Streamline process , Leverages , fosters.

Streamlining Mental Diagnostics: IoT-Enabled Enhanced EEG Telecare System

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Abstract:

Our paper introduces a pioneering approach to healthcare monitoring and cognitive control by amalgamating Brain-Computer Interface (BCI), Internet of Things (IoT), and Cloud Computing technologies. Existing methods relying on low-cost embedded systems often fail to efficiently transmit crucial patient data to healthcare providers, leading to suboptimal patient care. To counter this challenge, we propose an IoT-based system capable of long-distance, high-speed data transmission for continuous patient monitoring. Harnessing the power of EEG technology, our system enables real-time monitoring of brain activity, facilitating early detection of abnormalities. Upon detecting anomalies, the system automatically notifies healthcare providers via IoT modules, enabling swift intervention and medication administration, potentially averting hospitalization. The proposed solution integrates hardware components such as Arduino Uno, ESP8266, EEG sensors, and LED displays, complemented by software tools like Arduino IDE and IoT platforms. Through rigorous testing and analysis, we showcase the efficacy and scalability of our solution in enhancing patient care and enabling remote monitoring Our paper aims to revolutionize healthcare delivery by offering an innovative and efficient method for health monitoring, particularly beneficial for bedridden patients and those requiring continuous supervision. With its potential to improve patient outcomes and streamline healthcare processes, our solution represents a significant advancement in the realm of medical IoT and cognitive control.

Keywords:

Cognitive control, Internet of Things (IoT), Cloud Computing, GSM Module, LCD Display, ESP8266, Patient Care, Predictive Analytics, Brain Computer Interface (BCI)

Smart Assistance Gloves for Impaired People

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Abstract:

Everyday citizens face trouble in understanding the sign language. To defeat these continuous issues, this framework is created. This work describes a way to reduce barrier of communication by developing an assistive device for deaf-mute persons. There have been several researches done in order to find an easier way for non-vocal people to communicate with vocal people and express themselves to the hearing world. The key goal of the proposed plan is to design a cost-effective device that can give voice to a voiceless individual with the help of Smart Gloves. Flex sensors were used to record the movement and variation. The end product of this project is a combination of a mobile application that can translate the sign language into digital voice and IOT- enabled and Cloud, light-weighted wearable glove, which capable of recognizing different signs which were enabled. We have implemented this project with the Arduino software and the algorithms used are gesture recognition algorithm, sensor data processing, cloud based natural language processing (NLP), data encryption and security algorithms. Better user experience provides with voice-to-text feature in mobile application to reduce the communication gap within mute and non-mute communities.

Keywords:

Non-Vocal, Sign Language, Smart Glove, Gesture.

Sustainable Textile Waste Management through IoT Integration

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Abstract:

In the contemporary era, it's imperative to seek sustainable methods for waste management. Among the array of waste types, textile waste presents a formidable challenge due to its intricate nature and considerable environmental repercussions. To tackle this challenge, there's a growing demand for innovative solutions capable of efficiently gathering and recycling discarded textiles. This project introduces a Smart Textile Waste Collection System leveraging Internet of Things (IoT) technology. This approach aims to revolutionize textile waste management, rendering it more sustainable and environmentally conscious. The real-time data collected by the IoT-enabled system can be used to optimize waste collection routes and schedules, leading to greater operational efficiency. Implementation of innovative waste management solutions like this can raise awareness about the importance of sustainable practices and encourage public participation in waste reduction efforts. By utilizing sensors to monitor bin fill levels and transmitting real-time data to a central server, this system has the potential to transform the way we manage textile waste. Ultimately, the goal is to make textile waste management more sustainable and environmentally conscious, contributing to a cleaner and healthier planet for future generations.

Keywords:

Internet of Things, Textile waste, Sustainable

IoT-Monitored Artificial System for Electrically Controlled Organic Waste Management

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Abstract:

Waste in a country can essentially be divided into two main categories: organic and inorganic waste. Organic waste poses a significant threat to humanity as it can release dangerous gases such as carbon dioxide, methane, and hydrogen sulphide when not properly treated. These gases, collectively known as marsh gas, can seep into the soil with rainwater, contaminating the underground water sources. Therefore, it's crucial to manage organic waste effectively. Traditional methods for managing organic waste include landfill disposal and incineration. However, the Black Soldier Fly (BSF) technique, despite its effectiveness, hasn't gained widespread popularity due to its requirement for considerable human involvement. To address this challenge, a novel system has been developed that combines electric control with artificial environments conducive to the breeding of black soldier fly larvae, which play a vital role in the degradation of organic waste. This system, which requires minimal human interaction, can be monitored remotely from anywhere in the world through IoT technology. Sensors are used to oversee the system's operation. Importantly, the by-products of this process are environmentally safe and can generate revenue when sold as animal feed or used as fertilizer for crops.

Keywords:

Black soldier flies, Organic waste , IoT monitoring.

Piezo-Electric Footwear for Diabetic Wellness and Data Analytics

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Abstract:

The objective of the project is to address twofold first, the need for sustainable energy sources to power electronic devices, particularly for individuals who walk frequently; and second, the necessity for effective foot rehabilitation solutions, particularly for diabetic patients, to improve blood circulation and prevent complications. This project focuses on designing a footwear system equipped with piezoelectric crystals strategically placed to harness foot pressure during walking. The mechanical strain generated by footsteps is converted into electrical energy, which is stored in a battery integrated into the footwear. The generated electrical energy powers a vibrator mechanism aimed at enhancing blood circulation in diabetic patients' feet. Additionally, the systems transmit data to the cloud, where foot pressure patterns and energy production are tracked and visualized through a web application. This integration allows for real-time monitoring of user activity and energy generation, facilitating both energy harvesting research and personalized foot rehabilitation strategies.

Keywords:

Footwear, Blood Circulation, Foot Rehabilitation, Electricity Generation, Diabetic Patient's.

Integrated Monitoring System for Ammonia and H2S Gas Emission from Bird Litter with Chicken Disease Detection using Deep Learning

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Abstract:

The poultry industry plays a crucial role in meeting global food demands, but it also faces significant challenges related to environmental sustainability and animal health. To address these challenges, this project introduces an integrated monitoring system designed to track and analyze the levels of ammonia and gas emissions from bird litters in poultry farms while also incorporating chicken disease detection from feces using deep learning techniques. Leveraging a combination of sensors including DHT11 for temperature, MQ135 for air quality, MQ136 for ammonia detection, GPS for location tracking, pH sensor for litter acidity, and deep learning Densenet models for disease detection, the system offers a comprehensive approach to monitoring environmental conditions and poultry health. By providing real-time data acquisition, analysis, and disease detection, it enables proactive measures for emission control, disease prevention, and overall welfare management. This innovative system holds immense potential for revolutionizing poultry farming practices, ensuring environmental sustainability, and promoting the well-being of both livestock and farmers.

Keywords:

Ammonia Detection, Diseases, Bird Litter.

IoT Based Electricity Theft Monitoring System Using Raspberry PI

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Abstract:

With the increasing demand for efficient and reliable electricity distribution, the issue of electricity theft has become a significant concern for utility providers. This study presents an IoT-based electricity theft monitoring system using Raspberry Pi, aimed at detecting and preventing unauthorized electricity consumption. The system employs current sensors to monitor the flow of electricity and Raspberry Pi for data collection, processing, and transmission to a centralized server. The proposed system utilizes machine learning algorithms to analyze the electricity consumption patterns and identify anomalies that may indicate theft or unauthorized usage. Real-time alerts are generated and sent to the utility provider and relevant authorities for immediate action. Additionally, the system offers a user-friendly interface for monitoring electricity usage and detecting potential theft at the consumer level. Preliminary testing of the IoT-based electricity theft monitoring system demonstrated promising results in accurately detecting and reporting instances of electricity theft. The system proved to be effective in reducing financial losses for utility providers and ensuring fair distribution of electricity among consumers.

Keywords:

IoT, Electricity Theft Monitoring, Raspberry Pi, Current Sensors, Voltage sensor, Real-time Monitoring.

Bone Fracture Reduction Using Orthopedic Bone Drilling Robot (OBDR) in Musculoskeletal Surgery

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Abstract:

Orthopaedic surgery often involves precise bone drilling procedures, which require skilled expertise and steady hands to minimize the risk of complications. To address this challenge, orthopaedic bone drilling robots have emerged as promising solutions to enhance surgical precision and patient outcomes. This paper presents the design and development of an advanced orthopaedic bone drilling robot equipped with state-of-the-art technology. The robot incorporates high-resolution imaging systems to provide real-time feedback and navigation assistance to the surgeon, ensuring accurate drill placement and trajectory. Moreover, it integrates intelligent algorithms for automated path planning and collision avoidance, enhancing safety and efficiency during surgery. The robot is designed to be compatible with various orthopaedic procedures, including drilling for fracture fixation, joint arthroplasty, and spinal fusion. Through comprehensive testing and validation, the performance of the robot is evaluated in simulated surgical environments, demonstrating its effectiveness in improving drilling accuracy and reducing surgical time. Furthermore, clinical trials conducted on actual patients showcase the robot's capability to achieve superior outcomes compared to traditional manual techniques, with reduced incidence of complications and faster recovery rates. Overall, the orthopaedic bone drilling robot represents a significant advancement in orthopaedic surgery, offering surgeons a valuable tool to enhance their capabilities and improve patient care. For the drilling robot we are inserting the sensor the sensor will give the reading and the reading will display on lcd.

Keywords:

Orthopedic Bone Drilling Robot, Drilling Procedures, Surgical Precisions, Robotic Arm

EV BMS with Charge Monitor and Fire Protection with Zone Speed Control

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Abstract:
The project aims to develop a comprehensive Electric Vehicle Battery Management System (EV BMS) with advanced functionalities to enhance safety, efficiency, and performance. The EV BMS incorporates four key components: battery management, charge monitoring, fire protection, and zone speed control. The battery management aspect involves monitoring individual cell parameters such as voltage, temperature, and state of charge to ensure optimal performance and longevity of the battery pack. It implements balancing techniques to maintain uniform cell voltages and prevents overcharging or over-discharging, thereby safeguarding the battery's health. Charge monitoring is integrated into the BMS to track the charging process accurately, controlling voltage and current levels to prevent overcharging and mitigate risks of battery degradation or thermal runaway. To address safety concerns, the BMS includes sophisticated fire protection mechanisms. These mechanisms encompass temperature monitoring, smoke detection, and fire suppression systems to detect and mitigate fire hazards, ensuring the safety of both the vehicle occupants and surroundings. Additionally, the BMS incorporates zone speed control functionality, enabling dynamic adjustment of vehicle speed based on geographic location. This feature enhances safety by automatically restricting vehicle speed in designated zones such as residential areas or construction sites, contributing to overall road safety. The project aims to deliver a robust, reliable, and innovative EV BMS solution, addressing critical aspects of battery management, safety, and regulatory compliance. Through the integration of these advanced functionalities, the proposed system strives to contribute to the advancement of electric vehicle technology while ensuring safety and efficiency in operation.

Keywords:
Electric Vehicle, Battery Management System, Charge Monitoring, Fire Protection, Zone Speed Control, Battery Health, Safety, Efficiency, Performance, Monitoring, Balancing, Overcharging Prevention, Thermal Runaway, Geographic Location, Regulatory Compliance, Innovation, Robustness, Reliability, Advanced Functionality, Road Safety

Internet of Things Based Smart Refrigeration System

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Abstract:

Kitchen is one of the places where intelligent appliances have been used and also a place for lots of wastage of food and high consumption of energy. Nowadays grocery shopping has become a very big task. All the people who work are busy and find no time for grocery shopping. Refrigerator is a device that is used worldwide for storage of food. With the bustling life style, people often tend to resort to fast foods over home cooked meals. The proposed design of smart refrigerator deals with maintaining and notifies the users if they run out of groceries. It is also designed to sense the quality of the foods which prevents further food spoilage. The monitoring and notifications regarding the food status as well as the quality of the food would be done using an IOT webpage. Food Waste due to spoilage is a major problem in many households and restaurants. Food Waste, also known as food loss refers to food that is thrown out due to spoilage before being consumed by us. The users are not warned about the freshness or expiry of their food after it has been bought and stored in a refrigerate or unless they check on the goods. Furthermore, food goods are not clearly labeled with an expiry date to ensure the freshness of the food. The Internet of Things (IoT) provides a cutting-edge innovation in computing that holds the key in solving the issue. The concept of the IoT and the growth of smart kitchen appliances come together in the smart refrigeration system.

Keywords:

IoT, Electricity Theft Monitoring, Raspberry Pi, Current Sensors, Voltage sensor, Real-time Monitoring.

Air Pollution Prediction using IoT and Machine Learning

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Abstract:
An air pollutant is a substance in the air that can have adverse effects on humans and the ecosystem. The substance can be solid particles, liquid droplets, or gases. The work proposes an innovative approach to predict air pollution levels using a combination of IoT and machine learning techniques. Leveraging IoT devices equipped with sensors (MQ135, MQ2), real-time data on various pollutants (SO2, NO2) is collected. Machine learning model (Logistic regression) is then trained using these real-time datas to forecast pollution levels using the Raspberry-Pi controller. The integration of IoT and machine learning enables timely and accurate predictions, facilitating proactive measures to mitigate pollution and safeguard public health. This work contributes to the advancement of environmental monitoring systems, offering a scalable and efficient solution for predicting air quality for 7 days. The proposed framework holds promise for application in urban planning, environmental policymaking, and public awareness aimed at reducing air pollution and its adverse impacts.

Keywords:,

Air quality, Pollutants, Logistic regression, Smoke Sensors, Prediction.

Smart Medication Management Assistive Technology using Artificial Intelligence for Blind and Elderly Community

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Abstract:
This work proposes a novel approach to smart medication management for individuals with visual impairments utilizing artificial intelligence (AI) technology. The system aims to enhance medication adherence and safety for blind and elderly users through the integration of AI-based assistive technologies. Leveraging machine learning algorithms, the proposed system assists users in identifying, organizing, and administering medications independently. The blind and elder people were depending by a other person but in this project independently they can take a medicine. Key features include medication recognition through image processing, personalized dosage reminders using IR sensor, interactive voice-guided instruction through the speaker and the entire operation is managed by Arduino micro controller. The entire project is developed using Apache Cordova mobile development framework. The system's AI algorithms continuously adapt to user preferences and medication schedules, ensuring effectiveness and reliability. Accessibility considerations are paramount, with a focus on intuitive user interfaces and seamless integration with existing assistive technologies. Overall, this work presents a promising solution to empower individuals with visual impairments in managing their medications efficiently and autonomously.

Keywords:

Blind and Elder people, Apache Cordova, Arduino, IR Sensor box, Image processing

Energy harvesting by using E vehicles

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Abstract:

Electric vehicles (EVs) represent a promising solution for reducing greenhouse gas, emissions and dependence on fossil fuels in the transportation sector. As the world transitions towards sustainable mobility, the need to maximize the efficiency and Range of EVs becomes paramount. Energy harvesting, the process of capturing and storing energy from various sources, presents a compelling opportunity to enhance the performance and sustainability of electric vehicles. In this introduction, we will explore the concept of energy harvesting in the context of electric vehicles, highlighting its potential benefits and key technologies. By tapping into the kinetic, thermal, and solar energy available during vehicle operation, energy harvesting systems can supplement the vehicle's onboard power source, improve efficiency, and extend driving range. Moreover, energy harvesting aligns with the principles of circular economy and renewable energy, contributing to a more sustainable transportation ecosystem. Throughout this exploration, we will delve into the different methods of energy harvesting employed in electric vehicles, such as regenerative braking, solar panels, and kinetic energy recovery systems. Additionally, we will examine the challenges and opportunities associated with integrating these technologies into EVs, including efficiency considerations,

Keywords:

Electric Vehicle, Energy Harvesting, Renewable energy

Smart Parking System Using GSM And IoT

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Abstract:

This project uses a smart parking system utilizing infrared (IR) sensors. The system aims to optimize parking space utilization by detecting vehicle presence through IR sensors. By transmitting data to a centralized system, real-time information on parking availability can be accessed by users. Through this technology, drivers can efficiently locate and reserve parking spots, reducing traffic congestion and carbon emissions. The system's integration with existing infrastructure offers scalability and adaptability for various parking environments. Overall, this project offers a practical solution to enhance urban parking management and improve the overall parking experience.

Keywords:

IoT, Keypad ,Smart parking system, Arduino, IR Sensors, GSM module, Node MCU , Servo motor.

IoT-Powered Smart Agriculture Framework for Moringa Cultivation

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Abstract:

The increasing demand for sustainable agricultural practices necessitates the integration of modern technologies into traditional farming methods. This project proposes an IoT-powered smart agriculture framework tailored specifically for the cultivation of Moringa, a highly nutritious and drought-resistant crop. The framework aims to enhance Moringa cultivation efficiency, productivity, and sustainability by leveraging IoT sensors, data analytics, and automation. The proposed framework comprises several components, including environmental monitoring sensors, irrigation systems, and automated nutrient delivery mechanisms. These components collect real-time data on crucial parameters such as soil moisture, temperature, humidity, and nutrient levels, enabling precise and timely interventions to optimize growing conditions. Machine learning algorithms analyze the collected data to provide insights into crop health, pest infestations, and resource usage, enabling farmers to make data-driven decisions for improved yield and resource efficiency. Moreover, the framework incorporates remote monitoring and control capabilities, allowing farmers to manage and adjust cultivation parameters from anywhere via a smartphone or computer interface. This feature enables proactive management, early detection of issues, and swift responses to changing environmental conditions, thereby minimizing crop losses and maximizing yield. Overall, the proposed IoT-powered smart agriculture framework offers a holistic solution for Moringa cultivation, empowering farmers with the tools and insights needed to achieve sustainable and profitable production in alignment with the demands of modern agriculture.

Keywords:

Moringa Cultivation, Sustainable practices, Machine learning.

Block chain-Powered Drug Safety Assurance and Counterfeit Detection with Edge Computing

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Abstract:

This paper proposes a cutting-edge solution to enhance drug safety assurance and combat counterfeit medications in the pharmaceutical supply chain. By integrating block chain technology and edge computing, the proposed framework ensures transparency, traceability, and data integrity throughout the supply chain. Block chain's decentralized ledger records every transaction, enabling real-time verification of drug authenticity and provenance. Additionally, edge computing facilitates near real-time data processing and analysis at the network's edge, enhancing responsiveness and enabling proactive monitoring. Key features include smart contracts for automated validation, secure communication protocols for edge devices, and interoperability standards for seamless integration. This innovative approach not only enables efficient counterfeit detection but also improves regulatory compliance, streamlines inventory management, and enhances patient safety. Through collaboration and transparency, stakeholders can exchange information securely, fortifying trust and accountability in the pharmaceutical ecosystem. Overall, the proposed solution empowers the industry to safeguard drug supply chains, mitigate counterfeit risks, and uphold its commitment to delivering safe medications worldwide.

Keywords:

Block chain, Edge Computing, Drug Safety Assurance, Counterfeit Detection, Supply Chain Transparency, Pharmaceutical Industry, Internet of Things (IoT), Smart Contracts, Data Integrity, Real-time Monitoring, Patient Safety.

Transformer Monitoring System Using GSM Module

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Abstract:
In recent times, farmers are facing a lot of issues related to transformers mainly in summer season. Transformers are susceptible to various issues such as overheating, oil leakage, and insulation degradation, which can lead to costly failures, power outages, and safety hazards. This project is designed to solve these issues by continuously monitoring the transformer. This paper presents design and implementation of a mobile embedded system to monitor and record key operation indicators of a distribution transformer like load currents, transformer oil and ambient temperatures. The proposed on-line monitoring system integrates a global service mobile (GSM) MODEM, with stand-alone single chip microcontroller (Arduino UNO) and sensor packages. It is installed at the distribution transformer site and the above mentioned parameters are recorded using the built-in S-channel Analog to Digital Converter (ADC) of the embedded system. The acquired parameters are processed and recorded in the system memory. If there is any abnormality or an emergency situation the system sends SMS (short message service) messages to designated mobile telephones containing information about the abnormality according to some predefined instructions and policies that are stored on the embedded system EEPROM. Also, it sends SMS to a central database via the GSM MODEM for further processing. This mobile system will help the utilities to optimally utilize transformers and identify problems before any catastrophic failure.

Keywords:
Transformer, Arduino Uno, Sensors, GSM Module

IoT Based Short Circuit Protection

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Abstract:
Modern industries and appliances use very complex and sensitive electronic components. These systems are very sensitive and could easily burn out if over-current occurs. Thus, modern day systems demand extremely fast circuit breakers to protect the circuit from high current and over load conditions. Conventional circuit breakers like miniature circuit breaker or a fuse is good at breaking the circuit when a short circuit fault occurs. But when an overload fault occurs, the tripping time is slow and depends on the percentage of overload. In this project an electronic circuit breaker is designed to meet these demands of the modern industry. In circuit breaker a relay is used which cuts the circuit automatically and we don't need any manual push to the circuit. This project is designed to identify high voltage, low voltage, open circuit and short circuit conditions in electrical appliances and it automatically breaks the circuit. In this project high voltage, low voltage, open circuit and short circuit conditions are monitored using sensor and the same is communicated to NODE MCU. Based on the input, microcontroller ON/OFF circuit breakers. A GSM module is integrated with the circuit breaker to allow the users to remotely monitor the systems; it is also programmed to send messages to the users to alert them of fault conditions.

Keywords:
Circuit Breaker, Relay, Sensors, NODE MCU

Intelligent Ambulance Dispatch System with Continuous Patient Monitoring

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Abstract:
The integration of health information technology into primary care encompasses various electronic methods. In rural areas, limited access to healthcare facilities and ambulance services due to factors such as long distances, poor road infrastructure, and staffing shortages pose significant challenges, leading to delays in emergency response and poorer patient outcomes. This paper addresses the issues by optimizing emergency response through real-time dispatch of the nearest ambulance and continuous monitoring of patients during transit. This system enables remote consultation with medical specialists, data-driven decision-making for resource allocation, and seamless coordination among stakeholders. By ensuring timely interventions and access to specialized care, particularly in remote communities, this system significantly improves patient outcomes and saves lives. The proposed work focuses on the development of an intelligent stretcher and monitoring system that collects the information from the sensors like temperature sensor, humidity sensor, respiratory sensor, pulse sensor, pulse oximetry sensor and transmits to hospitals before ambulance arrival, facilitating better and more efficient treatment. Utilizing Arduino-based sensors, the Integrated Arduino-based Patient Monitoring (IACPM) system monitors vital signs and GPS location in real-time during ambulance transit, enhancing the quality of care and response efficiency.

Keywords:

Health information technology, Monitoring crucial signs, Integrated Arduino-based Patient Monitoring (IACPM) system, Patient information, Sensors, Real-time monitoring, GPS location NodeMcu.

IoT-Powered Safety Jacket for Enhanced Protection of Miners

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Abstract:
This paper addresses miner safety through the implementation of a cutting-edge safety system in coal mines. By harnessing IoT technology, a smart safety jacket has been developed to monitor miners' health and their environment in real-time. Utilizing ZigBee, this jacket provides timely precautionary measures to ensure the well-being of miners. Through continuous monitoring and data analysis, potential hazards can be identified and addressed promptly, significantly improving overall safety standards in mining operations. Integrating smart safety jackets with different health sensors such as pulse sensor, temperature sensor, blood pressure sensor, MQ7 sensor and the sensors continuously transmit data to the cloud via Arduino integrated with ZigBee, promptly notifying the responsible individual in the control room and alerting the miners in case of any abnormal occurrences. As, mining take place deep underground it can be more vulnerable to toxic gases, low oxygen level, hazardous gases can be detected with MQ7 gas sensor. The developed system is mainly implemented to improve the working condition inside the coal mines and also to ensure workers safety.

Keywords:

IoT-Powered Safety Jacket, Sensors, Arduino, Real-time Monitoring, Accident Prevention.

Gamified App for Learning by Persons with Disabilities

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Abstract:
The Inclusive Game-Based Learning Platform represents a groundbreaking leap forward in the realm of education, bridging accessibility, inclusivity, and engagement like never before. Drawing from the foundational principles of Universal Design for Learning (UDL) and incorporating state-of-the-art accessibility features, this platform stands as a beacon of innovation, offering an enriching and interactive learning environment for learners of diverse abilities. At its core, the platform embodies adaptability and personalization, allowing learners to chart their unique learning paths, collaborate seamlessly with peers, receive tailored feedback, and actively engage in their educational journey. The process begins with the arrival of a unit load, which is then identified as being composed of parts. A process plan is then created that allocates resources and creates a work schedule. The plan also includes a periodic release schedule and takes into account breakdowns and maintenance. In essence, the Inclusive Game-Based Learning Platform is not just a product—it's a catalyst for change, a catalyst that celebrates diversity, empowers learners, and unlocks the true potential of inclusive education.

Keywords:

Universal Design for Learning(UDL), Game based learning

AI -based CCTV accident detection and nearby patrol alert system using AI

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Abstract:

This project describes various automatic road accident detection techniques, which automatically detect accidents using surveillance videos in real-time and intimates the event scenario to control room and the main uniqueness of the system is it automatically estimates the crash value of the incident and intimates to the user. The proposed method assumes that traffic accident events are described by visual features occurring through a temporal way. The visual and temporal features are learned in the training phase through convolution and recurrent layers using built-from-scratch and public datasets. The accident detection systems lie in their ability to accurately distinguish between normal incidents and potential accidents within video data. Existing approaches often lack precision that leverages CNN to efficiently extract deep representations from video instances. To enhance the reliability and efficiency of accident detection, contributing to improved safety and timely intervention in critical situations.

Keywords:

CNN – Accident Detection – Intimate – Visual – Automatically- Temporal

Cosmetic Suggestion Based on Skin Condition Using AI

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Abstract:

Our project proposes a novel approach to personalized cosmetic recommendations leveraging Convolutional Neural Networks (CNN) and DenseNet architecture. By analyzing images of various skin conditions, our system learns intricate patterns and features to suggest suitable cosmetic products. Through robust training on diverse datasets, including acne, eczema, and aging skin, our model achieves high accuracy in identifying specific skin conditions. It then matches these conditions with appropriate skincare products, considering ingredients and efficacy. The system's intuitive interface provides users with accessible and understandable recommendations, enhancing consumer decision-making in skincare. This innovative application of AI technology not only revolutionizes the cosmetics industry but also empowers individuals to make informed choices tailored to their unique skin needs.

Keywords:

Cosmetic recommendation, Skin condition analysis, Convolutional Neural Networks (CNN), DenseNet architecture, Facial image analysis, Personalized suggestions, Beauty industry, Skincare needs, AI-driven solutions, User satisfaction

Legal Ease: Empowering Access to Justice with AI

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Abstract:
Legal Ease revolutionizes access to legal guidance by harnessing the power of artificial intelligence (AI) and advanced natural language processing (NLP) techniques. In today's complex legal landscape, individuals often face barriers such as confusing terminology, high costs, and time-consuming research. Legal Ease addresses these challenges through its user-friendly platform, which features an AI-driven chatbot capable of understanding and responding to a wide range of legal inquiries. With a focus on simplicity, clarity, and accuracy, Legal Ease provides clear and concise answers tailored to users' needs, empowering them to navigate legal matters confidently. The platform's intuitive interface and multiple access channels ensure accessibility for individuals without legal expertise. Continuously learning and improving, Legal Ease stays up-to-date with changes in legal terminology and procedures, while also offering supplementary resources and tools to enhance the user experience. By making legal guidance accessible and understandable, Legal Ease strives to democratize access to justice and empower individuals to make informed decisions about their rights and responsibilities.

Keywords:

Legal Ease, artificial intelligence, AI, natural language processing, NLP, legal guidance, access to justice, user-friendly, chatbot, legal inquiries, simplicity, clarity, accuracy, accessibility, continuous improvement, democratization of justice.

Transforming Fashion Curation: AI-Powered Personalized Outfit Recommendations for Confident Style Expression

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Abstract:

In the realm of fashion, individuals often face challenges in making confident and informed decisions about their personal style due to the overwhelming array of clothing options and constantly changing trends. To address this, we present the AI Fashion Analyzer, a revolutionary platform that leverages advanced artificial intelligence and machine learning algorithms to provide personalized outfit recommendations tailored to each user's unique tastes, body type, and lifestyle. Through a user-friendly interface, users can input their style preferences and receive customized fashion suggestions that align with their individuality. The AI Fashion Analyzer analyzes current fashion trends, color combinations, and style coherence to offer tailored recommendations, empowering users to express their personal style confidently and effortlessly. With features such as image processing, educational resources, and integration with external platforms, the platform aims to redefine the fashion experience, making it more accessible and enjoyable for individuals worldwide. Through continuous improvement and refinement based on user feedback, the AI Fashion Analyzer sets out to revolutionize the way individuals curate their outfits, fostering self-expression and confidence in fashion choices..

Keywords:

Fashion, AI, Personalized, Outfit, Recommendations, Style, Machine Learning, Confidence, User-Friendly, Empowerment.

AI-Mine Assist: Voicebot to respond various Acts, Rules, and Regulations in Mining industries

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Abstract:

This project proposes an innovative solution to address the complexities and challenges faced by the mining industry regarding rules and regulations compliance. By leveraging cutting-edge technologies such as Artificial Intelligence (AI) and Natural Language Processing (NLP), the project aims to streamline access to crucial information through voicebot. Mining rules, regulations, and compliance data are stored in a Vector database, ensuring efficient storage and retrieval of information. User inquiries are matched to the database using advanced search algorithms, and the retrieved results are then processed by Large Language Models (LLM) to generate comprehensive and contextually relevant responses. This initiative aims to facilitate quick access to regulatory information, enabling better decision-making, adherence to rules, and environmental protection within the mining sector. Keywords: Mining industry, Rules and regulations, Compliance, Natural Language Processing (NLP), Voicebot, Vector database, Advanced search algorithms, Large Language Models (LLM).

Keywords:

Artificial Intelligence, NLP, Voicebot, LLM.

Detection of Phishing Websites

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Abstract:

Phishing, a prevalent cybercrime, involves deceiving individuals into divulging sensitive information through fraudulent websites. These sites mimic legitimate ones, aiming to steal usernames, passwords, and financial data. Detecting phishing sites is crucial to thwart these attacks, which evolve with technology. Machine learning offers robust defenses. Phishers prefer phishing because tricking individuals is easier than bypassing security measures. Phishing emails often contain malicious links that resemble genuine ones, using logos and other authentic details to deceive recipients. This study proposes a novel approach using machine learning, specifically the Gradient Boosting Classifier, to detect phishing websites based on URL features. By analyzing and comparing various URL characteristics between legitimate and phishing sites, the method effectively distinguishes between the two in real-time scenarios.

Keywords:

Phishing, Machine Learning, Fraudulent Websites, Gradient Boosting Classifier, URL Features, Real-Time Detection

DevMentor – AI based E-Learning Assistant

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Abstract:
DevMentor is an innovative AI-powered solution designed to address the challenges learners face in accessing timely and personalized assistance for programming and web development. In today's fast-paced digital learning environment, learners often struggle to find reliable guidance, hindering their ability to maximize their learning potential. DevMentor offers a unique approach by providing immediate and tailored assistance through an AI-powered chatbot. By analyzing user queries and learning progress, DevMentor delivers personalized responses, enabling learners to overcome obstacles efficiently and accelerate their proficiency in programming and web development. With its user-friendly interface, seamless integration with learning platforms, and scalable infrastructure, DevMentor offers a comprehensive solution that empowers learners to succeed in their learning journey with confidence and efficiency.

Keywords:

Personalized assistance, digital learning, AI-powered chatbot, timely guidance, tailored responses, user-friendly interface, seamless integration, scalable infrastructure, learning potential, efficiency.

IntruDTree -Cyber Intrusion Detection Model

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Abstract:

Cyber security has recently received enormous attention in today's security concerns, due to the popularity of the Internet-of-Things (IoT), the tremendous growth of computer networks, and the huge number of relevant applications. Thus, detecting various cyber-attacks or anomalies in a network and building an effective intrusion detection system that performs an essential role in today's security is becoming more important. Artificial intelligence, particularly machine learning techniques, can be used for building such a data-driven intelligent intrusion detection system. In order to achieve this goal, in this paper, we present an Intrusion Detection Tree ("IntruDTree") machine-learning-based security model that first takes into account the ranking of security features according to their importance and then build a tree-based generalized intrusion detection model based on the selected important features. This model is not only effective in terms of prediction accuracy for unseen test cases but also minimizes the computational complexity of the model by reducing the feature dimensions. Finally, the effectiveness of our IntruDTree model was examined by conducting experiments on cybersecurity datasets and computing the precision, recall, fscore, accuracy, and ROC values to evaluate. We also compare the outcome results of IntruDTree model with several traditional popular machine learning methods such as the naive Bayes classifier, logistic regression, support vector machines, and k-nearest neighbor, random forest, Ada boost, and gradient boosting to analyze the effectiveness of the resulting security model. Keywords: Intrusion, naive Bayes classifier, logistic regression, support vector machines, k-nearest neighbor, random forest, Ada boost, and gradient boosting.

Keywords:

Internet of Things, Intrusion Detection Tree, K-nearest neighbor, Random forest

Identification of leukemia Subtypes from Microscopic Images Using Convolutional Neural Network

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Abstract:

Leukemia diagnosis and subtype classification from microscopic images are critical for patient management. This study introduces a Convolutional Neural Network (CNN) approach aimed at automating the identification of leukemia subtypes. Leveraging transfer learning and data augmentation techniques, a dataset comprising annotated images was utilized for model training and evaluation. Through rigorous experimentation, the proposed CNN-based method demonstrates promising results in accurately classifying leukemia subtypes. The CNN model's performance was assessed using standard evaluation metrics such as accuracy, precision, recall, and F1-score. Results indicate the model's ability to effectively differentiate between various leukemia subtypes, showcasing its potential as a valuable diagnostic tool. By automating the classification process, the proposed approach offers the potential to streamline pathology workflows, leading to faster and more accurate diagnosis and treatment planning. Overall, this research underscores the significance of machine learning techniques, particularly CNNs, in advancing medical image analysis. The proposed method shows promise in enhancing leukemia diagnosis, potentially leading to improved patient outcomes and more efficient healthcare delivery. Further research and validation on larger and diverse at sets are warranted to fully realize the clinical utility of the CNN-based approach in leukemia subtype classification.

Keywords:

Convolutional Neural Network, leukemia, FI-Score

Sports Management System

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Abstract:
In an era where technology continues to revolutionize various domains, the sports industry stands poised for transformation through streamlined management systems. This paper presents a comprehensive Sports Management System (SMS) developed using Java programming language, designed to optimize the management of sports-related activities. The primary objective of the SMS is to offer a centralized platform for sports organizations to automate key processes, facilitate seamless communication among stakeholders, and elevate the overall experience for players and spectators alike. The SMS encompasses functionalities such as player registrations, match scheduling, score tracking, and administrative tasks, presenting a holistic solution for sports management needs. By leveraging Java's robust features, including object-oriented programming and platform independence, the system ensures scalability, flexibility, and ease of maintenance. Through the implementation of the SMS, sports organizations can streamline operations, minimize manual intervention, and allocate resources more efficiently. Additionally, the system fosters greater engagement and connectivity within the sports community, fostering a conducive environment for collaboration and growth. This paper contributes to the discourse on sports management by presenting a tangible solution that harnesses technology to enhance organizational efficiency and elevate the overall sports experience.

Keywords:

Technology, Sports Industry, Sports Management System, Centralized Platform, Automation, Scalability, Organizational Efficiency

Sign Language Detection using CNN and Bi-Directional LSTM

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Abstract:
In this project, we use the fusion of convolutional neural networks (CNN) and bidirectional long-term memory (Bi-LSTM) networks for sign language recognition, specifically focusing on the Indian Sign Language (ISL) dataset. Our approach combines the strengths of CNNs, which are able to capture spatial patterns in frames extracted from sign language videos, with Bi-LSTMs, which excel at modeling sequential data and capturing temporal dependencies between video frames. By combining CNNs and Bi-LSTMs, our model effectively captures both the spatial characteristics and temporal dynamics of sign language gestures, enabling accurate recognition. In addition, the Bi-LSTM architecture ensures robust handling of long-range dependencies and vanishing gradient problems, which is crucial for understanding sequential gestures over time. The technique improves the efficiency and accuracy of sign language recognition by using CNN to extract spatial characteristics and Bi-LSTM to record the temporal dynamics. This holistic approach enables complete learning, simplifies the training process and can lead to superior performance in ISL recognition.

Keywords:

Sign Language Recognition, Convolutional Neural Network, Bi-Directional LSTM, Indian Sign Language, hearing- impaired.

Advanced AI Based Age Detection and Web Content Controlling System

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Abstract:
Millions of consumers worldwide may access a tremendous amount of content thanks to the internet. The real problem, though, is when users under the age of 18 are prevented from accessing age-restricted content, which over time negatively affects the users' emotional and physical well-being. Kids are using their browsers for longer periods of time and may quickly access a wide variety of online content. However, developing a strategy for calculating creative complexity would guarantee children's safety on social media, which stands as one of the most crucial requirements in today's world. This method will only be applied to content control on the website. This proposed work uses a Haas cascade classifier for face identification in order to determine age, and Selenium is used to filter material based on age. Generally speaking, restricting internet access to particular age groups requires the use of two complex procedures, such as facial recognition and age estimate. Then, this proposed study has provided a new unified framework for age detection and facial recognition for a content management system. Through the combination of content restriction and age detection, our proposed work has built a system that accurately regulates the browser content. Selenium is applied after identifying the person's face and determining their age in order to control the website.

Keywords:

Internet access, age-restricted content, emotional well-being, physical well-being, browser usage, online content, creative complexity, children's safety, social media, content control, Haas cascade classifier, face identification, age determination, Selenium, internet restriction, facial recognition, age detection, content management system, browser content regulation.

Advanced Self-Intelligence Sound Based Women's Safety System

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Abstract:

The project aims to develop an innovative women's safety system integrating voice analysis, IoT, and machine learning to efficiently detect emergency situations. A comprehensive solution is proposed, utilizing Py-Sound for speech-to-text conversion and machine learning algorithms to identify emergency words. Integration with IoT devices like Node MCU facilitates seamless data transfer, while location tracking using GPS or Wi-Fi ensures accurate emergency response. Live streaming capabilities during emergencies, coupled with stringent security measures, enhance user safety. Real-time alerts to predefined contacts upon detecting harmful words further bolster the system's effectiveness, emphasizing swift action in critical situations.

Keywords:

Internet of Things, Node MCU, Machine Learning

Exploratory Data Analysis Tool

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Abstract:

Data need to be analyzed so as to produce good result. Using the result decision can be taken. For example recommendation system, ranking of the page, demand fore casting, prediction of purchase of the product. There are some leading companies where the review of the customer plays a great role to analyze the factor which influences the review rating. We have used Exploratory Data Analysis Tool (EDAT) which is an application, where data interpretations can be done in row and column format. We have used python for data analysis. it is object oriented ,interpreted and interactive programming language. it is open source with rich sets of libraries like pandas, MATplotlib, seaborn etc. We have used different types of charts and various types of parameter to analyze csv data sets. We have used python programming for the data analysis. Exploratory Data Analysis Tool (EDAT) is an approach to summarize the data by taking their main characteristics and visualize it with proper representations. EDAT focuses more narrowly on checking assumptions required for model fitting and hypothesis testing, and handling missing values and making transformations of variables as needed.

Keywords:

Data analysis, Exploratory Data Analysis Tool, Decision making, Python, Interactive, Open source, Efficient.

AI-Enhanced Conversational CRM for Sales Workflow

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Abstract:

This paper presents an innovative approach to enhancing Conversational Customer Relationship Management (CRM) systems within the context of sales workflows through the integration of Artificial Intelligence (AI) technologies. In the contemporary business landscape, maintaining effective communication with customers is paramount for fostering lasting relationships and driving sales growth. Conversational CRM systems serve as pivotal tools in this endeavor, facilitating personalized interactions and streamlined communication channels. The proposed AI-enhanced Conversational CRM system leverages advanced natural language processing (NLP), machine learning (ML), and sentiment analysis techniques to automate and optimize various stages of the sales workflow. By analyzing customer inquiries, feedback, and interactions in real-time, the system can dynamically adapt its responses and recommendations to suit individual preferences and needs. Through continuous learning from user interactions and feedback, the AI model evolves to deliver increasingly accurate and personalized responses, thereby enhancing customer satisfaction and loyalty. Key components of the AI-enhanced Conversational CRM system include intelligent chatbots, sentiment analysis algorithms, recommendation engines, and predictive analytics modules. These components work synergistically to enable proactive engagement with customers, anticipate their needs, and provide timely assistance throughout the sales process. Additionally, the system integrates seamlessly with existing CRM platforms, enriching customer data and enhancing the overall effectiveness of sales teams.

Keywords:

Conversational Customer Relationship Management, Artificial Intelligence, Natural Language Processing, Machine Learning

Organizational Data Storage System Using Block chain Technology

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Abstract:

In this block chain-based project, we harness decentralized ledger technology to safeguard sensitive organizational information and facilitate secure access among authorized personnel within our organization. Records are protected and accessible within the block chain framework. Organizational data, including proprietary documents, operational insights, and strategic plans, is securely stored in cryptographic blocks, each linked to the preceding one. These blocks ensure data integrity and confidentiality, with each piece of information associated with a digital identity representing authorized personnel or departments. This innovative approach not only enhances the security of organizational data but also enables swift retrieval from any location, at any time, fostering information sharing and collaboration while upholding stringent security standards. Furthermore, we introduce a novel feature wherein, during the mining process, any alterations to the data within a block will be automatically detected. This capability allows for the identification of tampered data and facilitates the restoration of the original information, ensuring the integrity of the block chain. Consequently, block chain technology assumes a pivotal role in modernizing organizational data management, reinforcing security measures, and boosting operational efficiency.

Keywords:

Decentralized ledger technology, organizational information, blockchain framework, cryptographic blocks, data integrity, security standards, digital identity, swift retrieval, data mining and tampering data.

A Machine Learning Model for the Accurate Prediction of Sepsis in ICU Patients

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Abstract:

The "Avgaat - Accurate Prediction of Sepsis in ICU Patients" project is a multifaceted initiative that combines awareness and predictive modeling to address sepsis, a life-threatening condition commonly encountered in intensive care units (ICUs). Central to this project is a robust awareness campaign designed to educate both the general public and healthcare professionals about sepsis. With a focus on raising awareness about the severity of sepsis and the pivotal role of early detection and intervention, this educational effort seeks to empower individuals to recognize sepsis symptoms and promptly seek medical attention. By shedding light on this critical issue, the campaign aims to save lives and reduce the devastating impact of sepsis. Concurrently, advanced machine learning techniques, specifically logistic regression algorithms, are employed to construct a predictive model for sepsis. This model undergoes meticulous fine-tuning to ensure accurate identification of sepsis risk in ICU patients. The model represents a powerful tool for early intervention, offering the potential to enhance patient outcomes and reduce the burden of sepsis. The data-driven approach encompasses comprehensive data preprocessing and addresses class imbalances in the dataset. The integration of the Sequential Organ Failure Assessment (SOFA) score, including the quick SOFA (qSOFA) criteria, enhances predictive accuracy by evaluating organ failure trajectories and risk factors. The qSOFA criteria play a crucial role in rapid risk assessment, especially concerning sepsis, allowing for swift interventions that can be life-saving. "Avgaat" epitomizes an interdisciplinary synergy of education, technology, and clinical insights. By fostering awareness and providing advanced predictive capabilities, it seeks to reduce the impact of sepsis, elevate standards of patient care, and improve survival rates in ICUs. The dedication to these objectives is unwavering. Moreover, the project maintains a dedicated website that serves as an essential platform for sepsis education and the dissemination of the predictive model to the medical community. This digital platform not only underscores the commitment to raising awareness but also facilitates the integration of advanced technologies into healthcare practices. In summary, "Avgaat" is a project that endeavors to create sepsis awareness, enhance predictive capabilities, and support healthcare

professionals and the general public in their fight against sepsis. This multifaceted initiative, deeply rooted in education, data-driven technologies, and clinical acumen, aims to contribute to a healthier and more informed future.

Keywords:

Sepsis, SOFA, qSOFA, Disease, and ICU Patients

AI-Based System Application Control for Aged and Paralyzed Patients

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Abstract:

In today's digital era, traditional input devices like keyboards and mice present significant obstacles for aged and paralyzed individuals, limiting their ability to interact with computers. This project aims to revolutionize their experience by developing a hands-free system tailored to their unique needs. Leveraging cutting-edge AI technologies such as facial landmark detection, eye tracking, and speech recognition, users can effortlessly control applications through subtle eye movements and verbal commands his project introduces an innovative hands-free human-computer interaction system that leverages advanced computer vision technologies, with a primary focus on Dlib's face detection and landmark prediction Complementing this, speech recognition has been seamlessly integrated to provide comprehensive system control, eliminating the need for physical contact with conventional input devices. The deliberate decision to exclude facial gestures, including mouth tracking, contributes to a streamlined and accessible user experience. This deliberate simplification of the interaction model enhances user engagement and ease of use. The synergistic combination of eye movement and speech recognition technologies represents a cutting-edge advancement in hands-free computing, showcasing the immense potential for intuitive control in diverse computing environments.

Keywords:

Hands-free human-computer interaction, Dlib's face detection, Speech recognition.

Predicting Retinal Diseases Using Efficient Image Processing

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Abstract:

"Clear Vision Gives You a Clear Life", this wording means a lot. Each and every person wishes to have a good vision to survive, enjoy, and have a peaceful life and most of people do the same. A promising good vision is presented by a good retina and its retinal health. As a coin has two sides there is also some diseases that affect the retinal layer in our eyes. A healthy retina is essential for clear vision. Retinal diseases are common as they can affect any part of the eye. As retinal diseases affect the vital eye tissue, they cause serious problems and affect vision, some even leading to blindness. Ones if people are affected with a retinal disease they come to know after a severe effect on vision. The sad part is that we don't even get any pain or wound when we get retinal disease, we can't predict the symptoms easily. After getting the decrease in vision rate common people will approach the eye hospitals and consult an ophthalmologist. They usually went through a screening test handling with CAD machines, which mean a Computer-Aided Diagnosis technique connected with the computer and to the internet connection. which is a complete Artificial Intelligent machine. Which will be costlier and common people don't get a better guideline to approach at the beginning stage. To overcome this issue, we have planned to develop an early predictor of pre-clinical signs of retinal disease symptoms by involving the Image Processing technique. Now we are planning to create a prototype of an "Early predictor of retinal diseases by image processing" and to implement it as a working model of the vending concept and to keep it in public places and allow common people to utilize it with less cost and with minimum handling. We have analyzed so many algorithms to implement our idea, finally, we are satisfied with HAAR Cascade Algorithm which is a Machine Learning Technique because one of the primary benefits of Haar cascades is that they are just so fast — it's hard to beat their speed. Some other ML algorithms will demand a fundus image for image processing later it will convert the color image to a grayscale image using a scanner, but the HAAR Algorithm does not demand it for all these reasons we have chosen, HAAR Algorithm and it also satisfies our needs to the extend. We are using Raspberry PI as a SoC, it will swap the work of a main frame computer because it is low cost, has huge processing power in a compact board, and has many interfaces. We are using PI Camera for image capture resolution with 1080p at 25 frames PI Camera has a better graphic processing capability than others.

Keywords:

Clear vision, Retinal health, Retinal diseases, Early predictor, Image processing, Haar cascade algorithm, Machine learning, OpenCV, Python programming, Raspberry Pi, SOC (System on Chip), Pi Camera

Design and implementation of Battery Management System for Electric Vehicles

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Abstract:
Accurate estimation of Li-Ion batteries life cycle is important to the battery management system (BMS). Compared to direct measurement methods and model-based methods, data-driven methods are drawing much attention for online SOH estimation due to their simple structure, flexibility for online application, and independence on battery model. Data-driven methods first extract a strong health indicator (HI) to measure the SOH and then build a machine learning model to map the relationship between them. Based on data analytics on the battery ageing data, this project proposes to use a partial charge and discharge current sequence. Then it is then fed into KNN algorithm, which has fast learning speed and good generalization property. By selecting charging and discharging capacity, the impact on the estimation accuracy is comprehensively evaluated. The proposed method is tested with an open dataset and the results verify the effectiveness of the proposed method. This project provides a review of the main battery SOH estimation methods, enlightening their main advantages and pointing out their limitations in terms of real time automotive compatibility and especially hybrid electric applications.

Keywords:

State of Health, Battery Management, Lithium-ion

Implementing Proximity Sensors in Intelligent Vehicle Automation

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Abstract:

Exploring the forefront of electric vehicle (EV) technology, this study focuses on two critical aspects: optimizing charging efficiency and enhancing safety protocols to mitigate accidents, particularly those prevalent during night time conditions characterized by intense lighting. Our research introduces novel approaches to address these challenges. By leveraging wireless power transmission systems, EVs can charge on the move, reducing reliance on stationary charging stations and significantly diminishing charging time. Furthermore, we propose integrating advanced proximity sensors capable of detecting light sources, empowering EVs to dynamically adjust to environmental changes and proactively avoid potential hazards posed by bright lights. Additionally, we investigate the potential of automatic speed control systems, utilizing real-time road condition analysis facilitated by proximity sensors, to further fortify safety measures by adjusting vehicle speed accordingly. Despite existing limitations in proximity sensor availability and charging infrastructure distribution, we anticipate advancements in EV automation to overcome these barriers, ushering in a future where electric transportation is not only safer but also more efficient and sustainable. Our study envisions extending the utility of proximity sensors for speed control, providing greater flexibility and effectiveness in accident prevention strategies. By synergizing these approaches, EVs can not only bolster safety features but also streamline charging processes, ushering in a new era of efficient and automated electric vehicle systems that prioritize both safety and sustainability in our transportation networks.

Keywords:

Electric vehicles, charging time, accident prevention, wireless power transmission, proximity sensors, light detection, automatic speed control, road conditions analysis, proximity sensors, charging, automation, time efficiency.

Drugs Rating Generation and Recommendation from Sentiment Analysis of Drug Reviews Using Machine Learning

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Abstract:

A recommendation system helps the user understand needs and provides guidelines when making decisions out of a sea of confusing information. Since that user-generated data is expressed in a variety of complex ways using human language, generating suggestions from a study of attitudes appears to be a challenging task. Healthcare sentiment analysis is less focused on making informed judgments and less engaged in raising the bar for public health. In this project, we create and put into use a drug recommendation system that analyzes drug reviews using sentiment analysis technology. The goal of this research is to create a system for making decisions that will enable patients to choose from a vast array of medications. In the initial stage of our development, we provide an approach to sentimental measurement for medicine reviews and offer ratings on medications. In addition, we analyze the dictionary sentiment, polarity of medicine reviews, patient conditions, and how accurate the reviews are useful to users. Next, to identify suitable drugs, we incorporate those variables into the recommendation algorithm. Convolution neural networks have been tested in experiments for recommendation based on the provided open dataset. To increase performance, analysis is done to fine-tune the settings for each method. In order to achieve good trade-offs between model accuracy, model efficiency, and model scalability, Linear Support Vector Classifier is improved in rating generation.

Keywords:

Drug Recommendation, Linear Support Vector Classifier

Skin Cancer Detection Using Machine Learning

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Abstract:

Skin cancer is a prevalent and potentially life-threatening condition, necessitating reliable diagnostic tools for early detection. This research focuses on developing an efficient and accurate skin cancer detection system utilizing Convolutional Neural Networks (CNNs). Leveraging CNN's ability to automatically learn hierarchical features from dermatoscopic images, the proposed approach aims to improve classification accuracy for distinguishing between malignant and benign lesions. By training the model on a diverse dataset encompassing various skin lesion types, the system demonstrates robust generalization capability, offering a promising avenue for timely intervention and potentially saving lives.The development of a skin cancer detection system using a Convolutional Neural Network (CNN) implemented on Raspberry Pi hardware. The CNN model is designed for efficient real-time processing of dermatoscopic images, providing a portable and accessible solution for skin cancer diagnosis. Leveraging the computational capabilities of the Raspberry Pi, the system incorporates a high-resolution camera module to capture skin lesion images for immediate analysis. By optimizing the CNN architecture for edge computing, the implementation strikes a balance between accuracy and computational efficiency. This hardware-based approach facilitates on-the-spot skin cancer detection, promoting point-of-care applications and demonstrating the practicality of deploying advanced deep learning models on resource-constrained devices for critical healthcare tasks.

Keywords:

Skin cancer, CNN Architecture, Layers, Improve Accuracy, Machine learning

Health Analysis Using Deep Learning

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Abstract:

A deep learning approach for health analysis leverages algorithms like CNN, logistic regression, random forest etc. to extract valuable insights from medical data. By employing deep neural networks, this methodology can effectively analyze complex medical datasets, including patient records, imaging scans, and more. Through sophisticated pattern recognition and feature extraction, deep learning models can detect and predict outcomes, and even assist in diagnosis and treatment planning. This technology holds immense potential for revolutionizing healthcare by enabling personalized medicine, early disease detection, and optimized treatment strategies. Overall, deep learning in health analysis offers a powerful toolset for healthcare professionals, researchers, and policymakers to improve patient care, advance medical research, and enhance public health initiatives.

Keywords:

Health analysis, Deep Learning

Effective Task Scheduling Scheme on Edge and Cloud Infrastructure for Video Analytics Applications

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Abstract:
With the proliferation of video data from various sources such as surveillance cameras, IoT devices, and mobile phones. The demand for real-time video analytics has surged. Edge and cloud computing infrastructures offer promising solutions for processing such large volumes of video data efficiently. However, effective task scheduling on these heterogeneous infrastructures remains a challenging problem. In this paper, we propose a novel task scheduling scheme tailored for video analytics applications that leverages both edge and cloud resources optimally. Our scheme considers factors such as data locality, computational capabilities, and network conditions to dynamically allocate tasks between edge and cloud nodes. Through extensive simulations and experiments, we demonstrate that our proposed scheme outperforms existing approaches in terms of latency, resource utilization, and energy efficiency, making it well-suited for real-world video analytics deployments.

Keywords:

Task Scheduling, Video Analytics, Edge Computing, Heterogeneous Resources, Cloud Infrastructure

Advanced Real-Time Bidirectional Sign Language Communication System in Support of Physically Challenged Persons

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Abstract:

Sign Language is the most expressive form of communication for speech and hearing impaired people to communicate with normal person but a normal person cannot understand sign language. So in order to break this barrier of communication there needs to be a system that can enable conversion of sign language to voice or text and voice or text to sign language and do it in real time. The systems that currently exist are not real time, do not facilitate two-way communication, require static surrounding conditions or have low recognition accuracy. There exist systems that have good accuracy but require external hardware like gloves [3] which increases the cost. Our contribution to solving this problem consists of a Sign Language Communication System. It is a real-time communications system built using the advancements in Image Processing, Deep Learning and Computer Vision that provides real-time sign language to text and text to sign language conversion. The project is software-based which can be installed on any computer with good specifications. It is also a two-way communication system allowing not just speech and hearing impaired to communicate with normal people but also other way around. The primary goal of our system is to enable hearing and speech impaired people to communicate with people that are not disabled in real time by interpreting alphabets, numbers and words in the Indian sign language.

Keywords:

Concurrent Neural Networks, Natural Language Processing, Machine Learning, Sign Language Converter, Computer Vision, Sing, Convolutional, Gesture, Fingerspelling, Alphabet

Data Integrity Auditing Without Private Key Storage for Secure Cloud Storage

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Abstract:
To ensure the integrity of the data stored in the cloud, many data integrity auditing schemes have been proposed. In most, if not all, of the existing schemes, a user needs to employ his private key to generate the data authenticators for realizing the data integrity auditing. Thus, the user has to possess a hardware token to store his private key and memorize a password to activate this private key. If this hardware token is lost or this password is forgotten, most of the current data integrity auditing schemes would be unable to work. In order to overcome this problem, we propose a new paradigm called data integrity auditing without private key storage and design such a scheme. In this scheme, we use biometric data as the user's fuzzy private key to avoid using the hardware token. Meanwhile, the scheme can still effectively complete the data integrity auditing. We utilize a linear sketch with coding and error correction processes to confirm the identity of the user. In addition, we design a new signature scheme which not only supports block less verifiability, but also is compatible with the linear sketch.

Keywords:

Data integrity auditing, Private key storage, linear sketch, Signature scheme

Enhancing Accessibility for the Visually Impaired: A Computer Vision Model

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Abstract:

In response to the pressing need for inclusive technology solutions, this research introduces an innovative approach to improve accessibility for individuals with visual impairments. The proposed computer vision model represents a significant advancement in leveraging cutting-edge technology to bridge accessibility gaps. Through sophisticated computer vision techniques, the model interprets and articulates the visual environment in real-time, providing crucial auditory feedback to users with visual impairments. This model capitalizes on deep learning algorithms to achieve exceptional accuracy in identifying objects, understanding scenes, and facilitating spatial navigation. Its adaptability across diverse environments, including indoor settings, outdoor spaces, and object recognition scenarios, enhances its utility for users in various contexts. The study encompasses a comprehensive lifecycle, from initial development to rigorous evaluation, showcasing the model's potential to foster independence and enrich the daily experiences of individuals with visual impairments. This research underscores the transformative impact of technological innovation in addressing accessibility challenges, offering a promising avenue toward creating a more inclusive and empowering society for all. In a world increasingly reliant on technology, ensuring equitable access for all individuals, regardless of ability, is paramount. The proposed model represents a significant leap forward, harnessing state-of-the-art computer vision techniques to interpret and convey visual information in real-time, thereby providing essential auditory feedback to users with visual impairments.

Keywords:

Computer Vision, Deep Learning, Python, CNN and Visually Impaired

Dengue Fever Prediction by Using Deep Learning

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Abstract:

In response to the escalating global health concern posed by dengue fever, this project presents an innovative solution for early detection by leveraging cutting-edge technologies. This research proposes a comprehensive system for early dengue detection by integrating sensors, a K-Nearest Neighbors (KNN) and cloud computing. Utilizing a Max30100 for spo2 levels, PPG sensor for pressure, a pH sensor for sweat analysis, and a DHT sensor for temperature, data is collected by the NodeMCU (ESP8266) and transmitted to the cloud. In the cloud, a pre-trained KNN model processes the sensor data to predict the likelihood of dengue based on historical patterns. The results are then relayed back to the NodeMCU, where they are displayed in real-time. This innovative approach harnesses the power of Internet of Things (IoT), machine learning, and cloud computing to enable efficient and timely dengue detection, fostering potential advancements in early intervention and public health monitoring. This proposed model represents a bold endeavour to harness the transformative potential of technology in the fight against dengue fever and other infectious diseases. Through the integration of sensor technology, machine learning algorithms, and cloud computing infrastructure, the proposed system offers a beacon of hope in the ongoing battle to safeguard public health and promote well-being on a global scale.

Keywords:

IoT based, Deep Learning, Python, KNN and Real-time monitoring.

Automatic AI Based Accident Detection and Crash Estimation Using CCTV Surveillance Images

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Abstract:

Intelligent communities are utilizing different creative ideas to improve the quality of human life. Due to fast growing sizes of our cities, need of travelling is constantly increasing, which in turn has increased count of vehicles on the roads. Increasing number of vehicles on the roads has brought about numerous difficulties for Street Traffic Management Authorities. Amongst different traffic related issues, road accidents are something worth giving attention to and have to be on the priority list. This project describes various automatic road accident detection techniques, which automatically detect accidents using surveillance videos in real-time and intimates the event scenario to control room and the main uniqueness of the system is it automatically estimates the crash value of the incident and intimates to the user. The proposed method assumes that traffic accident events are described by visual features occurring through a temporal way. Therefore, a visual features extraction phase, followed by a temporary pattern identification, compose the model architecture. The visual and temporal features are learned in the training phase through convolution and recurrent layers using built-from-scratch and public datasets. An accuracy of 98% is achieved in the detection of accidents in public traffic accident datasets, showing a high capacity in detection independent of the road structure.

Keywords:

Intelligent communities, Road accidents, automatic detection, surveillance videos and real time detection

Gesture Language Translator for Dumb and Deaf People Enable Talk Gloves

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Abstract:

Gesture Language translator for dumb and deaf people-Enable talk gloves presents the design and implementation of a hardware-based gesture language translator aimed at empowering individuals with speech and hearing impairments to communicate effectively. The system utilizes sensor technology, microcontroller programming, and signal processing algorithms to interpret hand gestures and translate them into spoken or textual language output. It aims to contribute to assistive technology solutions that promote inclusivity and independence for individuals with speech and hearing impairments. Future enhancements may include multilingual support, online translation integration, and advanced gesture recognition capabilities, fostering continued innovation in the field of assistive communication devices. Communication is a fundamental aspect of human interaction, serving as a bridge to convey thoughts, emotions, and ideas. However, for individuals with speech and hearing impairments, conventional forms of communication may present significant challenges, hindering their ability to express themselves and engage with others effectively.

Keywords:

Gesture, Enable Talk gloves, hardware based, Communication

Innovative Home Control System for Paralyzed Patients Using Eye Movement

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Abstract:

Disabled individuals represent a valuable human resource for society, and their effective participation is essential. In this context, we have developed a prototype system that enables the control of home appliances through eye movement for cursor control. The system utilizes a camera to capture images of eye movements and detects the position of the pupil's center. Based on the detected signals, the prototype can control various appliances, providing an innovative solution to enhance the quality of life for disabled individuals. In the realm of assistive technology, this project introduces a pioneering system tailored for individuals with mobility impairments, aiming to provide them with an innovative means of controlling home appliances through the precise tracking of ocular movements. The system leverages a dedicated camera for real-time image acquisition, with a focus on capturing the dynamic movements of the human eye. A central facet of the system entails the intricate analysis of these acquired eye movement images to discern the precise position of the pupil and ascertain its directional shifts. These analyzed signals serve as the foundation for issuing control commands to a variety of home appliances.

Keywords:

Cursor control, Camera, Eye movement, Signals, Sensor

Advanced Insurance Classification Based on Accident Vehicle Images Using Deep Learning

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Abstract:

This project aims to develop an accident image-based insurance classification system using a Deep Convolutional Neural Network (DCNN) with the Densenet model. The proposed system leverages the power of deep learning to automatically analyze accident images and classify them for insurance purposes. The Densenet model is chosen for its efficiency in feature extraction and classification. By training the model on a diverse dataset of accident images, the system can accurately identify and categorize different types of accidents, facilitating a more streamlined and automated insurance claim process. This innovative approach not only enhances the efficiency of insurance assessments but also contributes to improved road safety by providing valuable insights into accident patterns.

Keywords:

Densenet, Deep Convolutional Neural Network, image-based insurance classification

Data Security System Using Hybrid Cryptography and Steganography

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Abstract:

Cloud-based data storage offers several advantages over traditional paper records and client-server systems, especially when it comes to securing image data. As organizations look to the cloud for their image data storage needs, addressing security challenges becomes paramount. Cryptography plays a pivotal role in ensuring the privacy and confidentiality of image data in cloud-based systems. Managing encryption keys can be complex, especially in scenarios with multiple data owners and security domains within image data storage. To address these challenges, a distributed attribute-based encryption scheme is proposed, allowing access to image data from any source using a single key, thereby simplifying key management. In addition to traditional cryptography, the integration of Hadamard-based techniques can further enhance the security of image data in the cloud. Hadamard transforms, known for their role in signal processing and data compression, can be applied to encrypt and protect image data. By incorporating Hadamard transforms into the security framework, it is possible to introduce an additional layer of security and data integrity. In this proposed system, a combination of multiple cryptographic algorithms, including RC6 (Rivest Cipher 6), is utilized alongside image steganography to ensure image data security. All cryptographic algorithms used employ 128-bit keys, and LSB (Least Significant Bit) steganography is used to securely store key information, which includes details about the encrypted portions of the image, the algorithms used, and their respective keys. During the encryption process, the image is processed using Hadamard transforms and split into two parts, each of which is encrypted simultaneously using different encryption algorithms, facilitated by multithreading techniques. The key information is then concealed within an image using LSB steganography. This comprehensive approach guarantees better security and protection of image data by securely storing encrypted data and using the combined strength of steganography, cryptographic algorithms like RC6, and Hadamard transforms to bolster image data security within the cloud-based storage system. Incorporating Hadamard transforms into this security strategy can provide an added layer of complexity and effectiveness in securing.

Keywords:

Cryptography, RC6, Hadamard

Oil Spill Detection Using Deep Learning

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Abstract:

This project introduces an innovative and comprehensive method for the automated detection of oil spills in open sea environments, a critical task for safeguarding marine ecosystems and coastal regions. Our approach seamlessly integrates Convolutional Neural Networks (CNN) with Gray-Level Co-occurrence Matrix (GLCM) pre-processing, leveraging the strengths of both techniques to enhance the accuracy and efficiency of oil spill identification. The methodology begins with GLCM pre-processing, which extracts texture features from input images, capturing intricate spatial relationships and patterns indicative of oil spills. This initial step provides a richly textured representation of the image, which is then harnessed to train a CNN model. The CNN is meticulously designed to learn and recognize specific features and spatial characteristics associated with oil spills, thereby effectively enhancing its ability to distinguish between polluted and clean sea areas. Subsequently, this trained CNN model is applied to analyze real-time satellite or aerial imagery, enabling the rapid and automated detection of potential oil spill incidents. Rigorous evaluation using extensive real-world datasets showcases the approach's proficiency in accurately identifying oil spills while significantly expediting response and containment efforts. Consequently, this integrated system holds the promise of drastically reducing the ecological and economic consequences of oil spill events, establishing it as an invaluable tool for marine environmental monitoring and disaster management.

Keywords:

Deep Learning, Oil Spill, CNN, Marine Environment, Satellite or Aerial Image, Automated Detection.

Stroke Risk Prediction with Hybrid Deep Transfer Learning Framework

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Abstract:

A stroke has become a leading cause of death and long-term disability in the world with no effective treatment. Deep learning-based approaches have the potential to outperform existing stroke risk prediction models, but they rely on large well-labeled data. Due to the strict privacy protection policy in health-care systems, stroke data is usually distributed among different hospitals in small pieces. The positive and negative instances of such data are extremely imbalanced. Transfer learning can solve small data issue by exploiting the knowledge of a correlated domain, especially when multiple sources of data are available. In this work, we propose a novel Hybrid Deep Transfer Learning-based Stroke Risk Prediction (HDTL-SRP) scheme to exploit the knowledge structure from multiple correlated sources (i.e., external stroke data, chronic diseases data, such as hypertension and diabetes). The proposed framework has been extensively tested in synthetic and real-world scenarios and it outperforms the state-of-the-art stroke risk prediction models. It also shows the potential of real-world deployment among multiple hospitals aided with 5 G/B5G infrastructures.

Keywords:

Deep transfer learning, Generative adversarial networks, CNN, Python.

Website Vulnerability Scanning

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Abstract:

With the increasing complexity of web applications and the growing sophistication of cyber threats, ensuring the security of websites has become a paramount concern for businesses and individuals alike. Automated vulnerability scanning tools play a crucial role in identifying potential security weaknesses in web applications, allowing organizations to proactively address and mitigate risks. This paper presents a Python-based approach to website vulnerability scanning, leveraging the extensive capabilities of the Python programming language and its rich ecosystem of libraries. The proposed solution utilizes Python's versatility to perform various scanning tasks, including but not limited to cross-site scripting (XSS), SQL injection, and file inclusion vulnerabilities. The system architecture incorporates web scraping techniques to analyze website structure and content, allowing for dynamic identification of potential vulnerabilities. Furthermore, the integration of XML parsing facilitates the configuration and customization of scanning parameters, enabling users to tailor the scanning process to their specific requirements. The effectiveness of the proposed solution is demonstrated through practical implementation and testing on diverse web applications. The results indicate the ability of the scanner to detect a wide range of vulnerabilities accurately and efficiently, providing actionable insights for enhancing web application security. In conclusion, the website vulnerability scanning approach presented in this paper offers a flexible, scalable, and effective solution for identifying and addressing security vulnerabilities in web applications, thereby bolstering overall cybersecurity posture and mitigating potential risks.

Keywords:

Website Vulnerability, Vulnerability Scanning, Web application Security

Hospital Management System with Chatbot

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Abstract:

Through chatbots one can communicate with text or voice interface and get reply through artificial intelligence. Typically, a chat bot will communicate with a real person. Chat bots are used in applications such as ecommerce customer service, call centres and Internet gaming. Chatbots are programs built to automatically engage with received messages. Chatbots can be programmed to respond the same way each time, to respond differently to messages containing certain keywords and even to use machine learning to adapt their responses to fit the situation. A developing number of hospitals, nursing homes, and even private centres, presently utilize online Chatbots for human services on their sites. These bots connect with potential patients visiting the site, helping them discover specialists, booking their appointments, and getting them access to the correct treatment. In any case, the utilization of artificial intelligence in an industry where individuals' lives could be in question, still starts misgivings in individuals. It brings up issues about whether the task mentioned above ought to be assigned to human staff. This healthcare chatbot system will help hospitals to provide healthcare support online 24 x 7, it answers deep as well as general questions. It also helps to generate leads and automatically delivers the information of leads to sales. By asking the questions in series it helps patients by guiding what exactly looking for.

Keywords:

Hospital Management, Chatbot, Healthcare, Machine Learning.

AI Based Cancer Prediction System Using DCNN

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Abstract:
In this paper, we proposes an innovative approach to cancer prediction employing Deep Convolutional Neural Networks (DCNN). Cancer diagnosis and prognosis are critical tasks in healthcare, where early detection significantly impacts treatment outcomes. Leveraging the power of artificial intelligence, our system aims to improve the accuracy and efficiency of cancer prediction. By analyzing medical imaging data, the DCNN model autonomously extracts relevant features from images, facilitating the classification of tumors as benign or malignant. Through extensive training on diverse datasets, the system learns intricate patterns indicative of cancerous growths, enabling robust predictive capabilities. Furthermore, the system's adaptability allows seamless integration into existing healthcare infrastructure, enhancing clinical workflows. Ultimately, this AI-based cancer prediction system holds promise in revolutionizing early diagnosis, contributing to improved patient care and advancing research and treatment methodologies.

Keywords:

Cancer prediction, Deep Convolutional Neural Networks (DCNN), Healthcare, Artificial intelligence, Medical imaging data, Early diagnosis, Improved patient care.

Agri-Mart: A Smart E-Platform for Farmers

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Abstract:

India is an agro based country. The main livelihood of the majoritarian population here is through farming who dwell in villages and feed the whole country. Food is one of the basic necessities of a human being, which is fulfilled by the framers. However, they fail to get proper price of the stock they sell in the market. Hence, they are deprived from getting profits for their stock. AGRIMART helps them in getting proper price for their stock and even get profit for their efforts. In a city many people invest in shares sold by the companies, they buy shares in highest quoted price by the way of biding. In this way companies get profits through shares which are sold through a highest bid price. Here, we think of a similar scenario for the farmers in which they can get maximum pricing for their outcomes. To be sold to the wholesale venders. This idea is AGRIMART stock trading in which farmers can ask for the highest bid price for their stock to be sold and can earn profit. Also, farmers can register themselves and have various other facilities such as feedback, contact to the wholesalers, price notifications etc. This project is about a web portal for farmers where the marketplace to sell and buy their products, it is not only a platform for farmers, this can also help agriculture students. With the help of this platform agriculture students can also get help from farmers directly. Farmers and students can get updated themself about government schemes and etc.

Keywords:

Smart System, Agriculture.

Voice Assisted Text Reading System for Blind and Visually Impaired Persons through Artificial Intelligence powered Optical Character Recognition

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Abstract:

This project focuses on designing a voice-assisted Text reading and image detection systems powered by artificial intelligence Optical character recognition (OCR) for visually impaired persons, which helps visually affected persons to read books and bright LED screens and also includes a GPS tracking system to invigilate the impaired persons location status. The smart reader receives input through the use of a camera, an image of the printed text is captured. AI- driven OCR algorithm detect the texts in the image and forms the data base. The extracted text is then converted into a speech signal using Text to Speech Conversion (TTSC) algorithm, and the resulting audio is played through the speaker. The entire work flow is managed by Raspberry-pi controller. With the help of this voice-assisted system, persons with visual problems can travel around the world independently.

Keywords:

Voice Assistance, Text Reading System, OCR Technology, TTSC, GPS

Exploring Various Approaches to Image Fusion through Fuzzy Logic: A Comparative Study

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Abstract:

The term fusion encompasses the extraction of information acquired across multiple domains. Specifically, image fusion involves integrating multiple images of the same scene into a single fused image to reduce uncertainty and minimize redundancy while extracting all useful information from the source images. Fuzzy logic plays a crucial role in systems where there is no direct relation between input and output. In processes like image fusion, establishing a direct relation between the intensity of every pixel of the input image and the output image is challenging due to inherent uncertainty. Fuzzy logic offers a means to create a relation between the intensities of pixels in the input and output images. This paper presents different strategies for image fusion utilizing fuzzy logic. Through a comparative analysis of image fusion performance across various strategies applied to images captured under different lighting conditions, insights are gained for future endeavors in this field.

Keywords:

Image Fusion, Image Fusion Strategies, Image Fusion Performances

A Comprehensive Survey on Models for Analyzing Data Centre Performance and Quality of Service in Infrastructure as a Service (IaaS) Cloud Environments

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Abstract:

In recent years, there has been a significant migration of business applications to the cloud. However, this transition brings forth major challenges, particularly in data center management. One crucial aspect is ensuring Quality of Service (QoS) for these applications. This survey delves into the complexities of QoS provisioning in cloud environments and identifies data center management as a critical factor in meeting performance expectations. The survey not only explores QoS modeling approaches but also emphasizes the importance of leveraging analytical models to address these challenges effectively. Specifically, it examines the efficacy of stochastic reward net models, which offer a powerful framework for capturing the intricate interplay of various quality attributes, including utilization, availability, and waiting time. Furthermore, the survey seeks to provide insights into the evolving landscape of cloud computing by examining recent trends and emerging technologies that impact data center management and QoS provisioning. By synthesizing findings from recent research and real-world implementations, this survey aims to inform stakeholders about best practices and innovative strategies for optimizing data center performance and ensuring QoS excellence in Infrastructure as a Service (IaaS) cloud environments.

Keywords:

Cloud Computing, Reward Net Model, Quality of Service, IaaS

Enhancing Selective Region-Based Invisible Watermarking through Asymmetric Key Encryption

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Abstract:

This introduces an innovative approach to address invisible watermarking challenges by incorporating an interactive selection process for determining optimal threshold values. By allowing users to dynamically choose the desired area for watermark embedding, this method enhances flexibility and precision in watermark placement. Moreover, the approach involves encrypting the entire embedded image using a renowned asymmetric key cryptographic algorithm, RSA (Rivest-Shamir-Adleman). This ensures robust protection of the embedded watermark and the integrity of the original image. The encryption process employs a static encryption table generated by selecting two sufficiently large prime numbers, which are meticulously chosen to meet the specific requirements of the watermarking process. By integrating interactive selection and robust encryption, this approach offers a comprehensive solution for selective region-based invisible watermarking, bolstering security and ensuring the authenticity and confidentiality of digital images in various applications."

Keywords:

Encryption, Decryption, Steganography, Embedding, Threshold.

Meta-Learning Framework for Zero-Shot Time-Series Forecasting and Its Applications

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Abstract:

Can meta-learning uncover universal methods for processing diverse time series (TS) datasets, leading to substantial improvements in generalization across new TS datasets? This study presents affirmative evidence to this question through a comprehensive meta-learning framework, which encompasses numerous existing meta-learning algorithms. Theoretical analysis indicates that residual connections serve as a meta-learning adaptation mechanism, facilitating the generation of task-specific parameters based on input TS data. This mechanism progressively enhances the architecture's expressive capacity in real-time. Additionally, a linearization analysis reveals that the same mechanism can be interpreted as a sequential update of the final linear layer. Empirical findings across a diverse array of datasets underscore the significance of the identified meta-learning mechanisms in achieving successful zero-shot univariate forecasting. These findings suggest the feasibility of training a neural network on a source TS dataset and deploying it on a distinct target TS dataset without necessitating retraining. This approach yields performance levels that are comparable, if not superior, to those of state-of-the-art univariate forecasting models.

Keywords:

Zero-shot learning, Time series forecasting, Meta-learning, Neural network

Leveraging Artificial Intelligence (AI) Applications for Optimizing Operations in the Retail Sector

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Abstract:

The retail industry emerges as one of the most vibrant and enticing sectors, continuously adapting to the influx of innovative technologies such as IoT, Big Data Analytics, and block chain. Among these, Artificial Intelligence (AI) stands out as a transformative force, reshaping the very essence of retail operations. This study endeavors to offer a thorough examination of AI's integration within the retail sphere, encompassing diverse applications like voice and visual search, in-store assistance, chatbots, and customer satisfaction tracking systems. To accomplish this, a sample of 117 retail shoppers was selected using convenience sampling techniques. Employing survey research methodology, the data underwent analysis through descriptive statistics. The findings underscore a compelling narrative: retailers keen on maintaining their competitive edge are increasingly turning to AI solutions. Moreover, a majority of shoppers cite convenience, modernization, and virtual reality as pivotal factors influencing their future store preferences. Projections indicate that retail enterprises making substantial investments in AI are poised for success, while those failing to embrace this technological revolution risk losing significant market share to more innovative competitors.

Keywords:

Artificial Intelligence, Customer, Retail Industry, Retail Market.

Predicting Short-Term Variations in Ionospheric Total Electron Content (TEC) through Solar and Geomagnetic Data Integration

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Abstract:

The application of deep learning algorithms in investigating ionospheric weather patterns using historical ionospheric data under diverse space weather conditions has emerged as a valuable approach. Among the crucial parameters of the ionosphere, Total Electron Content (TEC) holds particular importance, yet predicting TEC remains a challenging endeavor, especially in anomaly crest stations. This study aims to develop and evaluate a novel technique based on Long Short-Term Memory (LSTM) neural networks for short-term ionospheric TEC prediction. The methodology employs a multi-input LSTM forecasting approach, which is tested for its effectiveness in forecasting ionospheric TEC over the Lhasa, China station (Longitude: 91.10397200, Latitude: 29.65734166), using vertical Total Electron Content (TECV) in conjunction with Solar and Geomagnetic time series data. Subsequently, the model's predictions are compared with TEC observations collected by the IGS network. The results demonstrate promising performance, with the model successfully capturing typical TEC profile variations and exhibiting strong capabilities in short-term ionospheric TEC prediction.

Keywords:

Total electron content (TEC), LSTM, Neural Network.

Utilizing ORB Feature Detection for Building Detection in Satellite Imagery

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Abstract:

Satellite image-based building detection stands as a critical domain within remote sensing and computer vision research. Over time, advancements in algorithms and methodologies have significantly improved the performance of building detection. Numerous techniques have been developed to accurately extract building features from high-resolution satellite images, even under standard contrast conditions. The utilization of ultra-high-resolution satellite imagery has greatly empowered researchers, particularly in delineating urban boundaries and identifying building placements. Manual extraction of such vital information is arduous for human specialists, prompting the exploration of automated solutions. However, traditional image processing and analysis methods often prove inadequate for this task. Feature extraction serves as a fundamental step in this pursuit, enabling the identification of relevant information from images. Leveraging feature descriptors, robust features can be isolated from the vast array of key points present in satellite imagery. In this study, two robust techniques are employed: FAST (Features from Accelerated Segment Test), a corner detection method for extracting feature points, and BRIEF (Binary Robust Independent Elementary Features), a versatile feature descriptor compatible with various detection methods. These approaches are favored for their efficiency and cost-effectiveness. Furthermore, the Oriented FAST and Rotated BRIEF (ORB) hybrid technique emerges as a notable solution, offering a rapid and robust local feature detection approach suitable for a myriad of computer vision applications, including object recognition. This project seeks to provide a swift and efficient alternative to traditional methods like Scale-Invariant Feature Transform (SIFT), renowned for its ability to detect and describe local features in images.

Keywords:

Satellite images, ORB, SIFT & SURF, FAST.

Detecting Malicious URLs with a Neural Model Approach

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Abstract:

A novel approach, named the Parallel Neural Joint Model (URL), is introduced for the study and detection of harmful Uniform Resource Locators (URLs). This technique combines semantic and visual information to identify and analyze features indicative of malicious URLs. Initially, a visualization method is applied to represent the URL as a grayscale image with distinct textural characteristics. Subsequently, lexical and character features of the URL are extracted and processed using word vector technology. To refine the extracted features, an attention mechanism is integrated into the final layer of the network, focusing on the most relevant information to improve classification accuracy and effectively identify harmful URLs. Experimental results demonstrate that the proposed algorithm surpasses standard approaches in terms of accuracy. Therefore, it can be concluded that the URL model offers superior performance in the detection of harmful URLs compared to traditional methods.

Keywords:

Malicious URL, Machine Learning.

Design and Implementation of a Dual-Axis Solar Tracking System

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Abstract:

The global energy challenge remains a pressing concern for modern society. Despite the abundance of sustainable energy sources, the efficient harnessing of these resources remains elusive. This paper presents a method aimed at enhancing the efficiency of solar panels by implementing a dual-axis solar tracker. By incorporating microcontroller technology to precisely track the sun's movement, this proposed system optimizes the conversion of solar energy into electricity. The experimental model of the dual-axis solar tracker operates using a servo motor, which adjusts the orientation of the solar panel based on input from four Light Dependent Resistors (LDR) sensors. The performance of the solar tracker is evaluated through experimental analysis, comparing its effectiveness to that of a stationary system. Results demonstrate that the proposed dual-axis solar tracker outperforms stationary counterparts, yielding higher power generation efficiency. This research highlights the potential of advanced tracking technologies to significantly enhance the output of solar energy systems, thereby contributing to the sustainable energy solutions urgently needed in today's world.

Keywords:

Solar energy, Solar Tracker, Panel, Servo motor, Dual axis.

Development of a Microcontroller-Based Waste Segregator for Efficient Management and Organic Fertilizer Production from Wet Waste

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Abstract:

The surge in industrialization, modernization, and population growth has precipitated a significant upsurge in waste generation, necessitating efficient waste management solutions. This paper proposes a prototype waste separator aimed at enhancing waste recycling by enabling effective segregation of waste materials. The prototype, termed the "smart-bin," is designed to autonomously segregate dumped waste, with sensors and motors integrated into an Arduino board to facilitate this process. Real-time information about the deposited waste is provided by the smart-bin, enabling timely action to be taken. The smart-bin is divided into three distinct sections, each tasked with segregating waste into dry, metal, and wet categories. Central to this research is the objective of producing organic fertilizer by creating an optimal environment for decomposing wet waste into nutrient-rich organic fertilizer. Through this innovative waste management approach, organic fertilizer production can be streamlined, promoting sustainable agricultural practices and mitigating the environmental impact of waste accumulation.

Keywords:

Arduino, Segregation, Organic Fertilizer

Advancing Efficiency with an Automated Multipurpose Metering System

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Abstract:

The project's objective is to efficiently reduce electricity, gas, and water consumption within residential areas. The proposed system comprises two primary sections: the domestic meter section and the server-controlled section. Communication between these two sections is facilitated through a wireless network. This system is designed to monitor users' energy consumption in kilowatts (KW). Readings from the respective sources will be recorded in the server, and customers will be provided with an application to communicate with the control base station. Through this application, customers will be able to track their daily usage of all three resources and monitor their consumption levels accordingly.

Keywords:

Arduino UNO, water flow meter, gas flow meter, solenoid valve , telegram transmitter

Developing an Arduino-Powered Energy Consumption Sensing System with a User-Friendly LabVIEW Interface

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Abstract:

The continuous increase in energy consumption and the consequent rise in energy costs highlight the critical need for efficient energy management. Effective solutions to current energy challenges in domestic settings hinge on optimizing energy usage. A pivotal aspect of achieving this optimization is the implementation of a smart monitoring system capable of providing real-time data on energy consumption. Existing systems tailored for household use often lack adequate data storage and wireless transmission capabilities. This paper addresses this gap by proposing the development of an automated electrical energy consumption sensing system equipped with both data storage and wireless transmission functionalities. Leveraging Arduino UNO and data logging Wi-Fi shields, this system offers a comprehensive solution. The Arduino Energy Consumption Sensing System represents a smart and advanced approach to monitoring energy consumption, ideal for real-time applications. Through the LabVIEW user interface, users gain insights into energy consumption trends, empowering them to minimize energy wastage and reduce costs effectively.

Keywords:

Arduino, Energy Consumption, LabVIEW, Monitoring, Sensors.

Exploring the Feasibility of Pond Ash as a Cement Substitute in Concrete: An Experimental Study

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Abstract:

Concrete, as the most widely used construction material, heavily relies on significant quantities of Portland cement. However, the production of Ordinary Portland Cement (OPC) generates substantial carbon dioxide emissions, contributing to environmental concerns. Consequently, there is an urgent need to explore alternative materials. Lake Pond ash concrete presents itself as an innovative construction material formed through the chemical interaction of inorganic particles, particularly utilizing thermally activated natural materials such as Lake Pond ash. Lake Pond ash, a byproduct of coal obtained from thermal power stations, boasts high levels of silica and alumina, enabling its reaction with an alkaline solution containing sodium hydroxide and sodium silicate. River sand remains the predominant choice for the fine aggregate component of concrete. This study aims to examine the mechanical properties, including compressive strength, splitting tensile strength, and flexural strength, of Lake Pond ash concrete in comparison to M40 grade concrete, with the objective of reducing cement consumption. The investigation involves varying percentages of Lake Pond ash replacement (15%, 25%, and 35% by weight of cement). Accelerated curing methods are employed, known to yield early and enhanced strength compared to conventional curing techniques. Through this study, the feasibility and effectiveness of incorporating Lake Pond ash as a sustainable alternative in concrete production are evaluated, aiming to address environmental concerns while maintaining structural integrity.

Keywords:

Ash, Concrete, Pond, Cement, Compressive Strength, Flexural Strength.

Probing Ionospheric Responses to Solar Wind Activity During Geomagnetic Storms

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Abstract:

Geomagnetic storms, driven by solar wind energy, have a significant impact on Earth's magnetosphere, especially when the interplanetary magnetic field (IMF) displays a negative (southward) Bz component. This alignment facilitates magnetic reconnection between the IMF and Earth's magnetic field, leading to an energy transfer efficiency of approximately 10% during intense storms. In this study, we explore the ionospheric reaction to solar wind activity during specific geomagnetic storm events. By employing Total Electron Content (TEC) and Bz as key indicators, we detect significant perturbations in the peak electron density of the F2 layer. These disruptions have implications for global communication networks, especially when coinciding with shifts in Bz orientation towards a northward trajectory. Our analysis underscores the complex relationship between solar wind dynamics and ionospheric variability, essential for advancing space weather prediction and strengthening the resilience of communication systems.

Keywords—Total Electron Content, Solar wind parameters, Geomagnetic storm, GPS.

Exploring Multivariate LSTM for Estimating Gross Calorific Value of Coals: A Study

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Abstract:

This study aims to present a novel approach for estimating the Gross Calorific Value (GCV) of coal using Multivariate Long Short-Term Memory (LSTM) models. Ten parameters, characterized by non-linear relationships, are considered in this investigation. These parameters are integrated into LSTM models developed using advanced methodology. The initial LSTM model incorporates the major constituents obtained from both proximate and ultimate analyses as inputs, while subsequent sub-models explore different combinations of these constituents. Our analysis reveals that models based on Artificial Neural Networks (ANNs) tend to yield more accurate results compared to those based on Recurrent Neural Networks (RNNs). Furthermore, our findings suggest that certain features of coal samples, such as moisture content and ash content, may exert a stronger influence on GCV estimation compared to others, such as volatile matter and He density.

Keywords:

Gross Calorific Value, Long Short-Term Memory, RNN, Root Mean Square Error.

Delving into Normal Spaces within the Realm of Topological Mathematics

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Abstract:

This paper explores the concept of normal spaces within the field of mathematics, particularly in topology. Topology investigates the fundamental properties of spaces that remain unchanged under continuous deformations. Despite its relatively recent emergence as a mathematical discipline, topology has witnessed substantial research since the turn of the 20th century. A normal space, denoted as X, is defined as a topological space where any two distinct points possess disjoint open neighborhoods. Moreover, a Hausdorff space satisfying this property is classified as a T4 space. Formally, a topological space X is considered normal if, for any pair of disjoint closed sets E and F, there exist open neighborhoods U of E and V of F that are also disjoint. In essence, this criterion ensures that it is always feasible to separate E and F using neighborhoods.

Keywords:

Normal Space, Topological Spaces, Invariant, Deformation, Intuitive.

Improving Crowbar Protection for Enhanced Fault Ride-Through Capability of Wind Energy Conversion Systems

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Abstract:

As the demand for electricity continues to surge, there is an urgent need to integrate renewable energy sources such as wind power into the power grid. However, despite the widespread availability of wind resources and the advancement of generator drive systems, incorporating wind energy poses significant challenges. The variability of wind patterns and the reliance on wind velocity for power output make it difficult to ensure system stability, especially during network disruptions. Furthermore, sudden outages can lead to the abrupt removal of wind power, impacting the overall stability of the electrical system. As wind turbines become more prevalent, the use of doubly fed induction motors for power generation is expected to increase, necessitating the implementation of sophisticated wind turbine systems that seamlessly integrate with the power grid. Additionally, with the escalating demand for electricity, the importance of embracing renewable energy sources such as solar and wind power cannot be overstated. Integrating these sources into the power system is crucial to meet growing energy demands while promoting sustainability and resilience in the energy sector.

Keywords:

Powergrid, Stability, Wind Energy

Energy Management study on Challenges in 11kV Distribution Systems with Distribution Transformers

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Abstract:

India boasts one of the world's largest and most intricate power sectors, which has undergone remarkable growth and transformation in recent decades. The enactment of the Electricity Act in 2003 marked a significant milestone, triggering a major overhaul aimed at fostering competition, nurturing the development of the electricity industry, safeguarding consumer interests, ensuring universal access to electricity, curbing losses, and rationalizing tariff structures. Substantial strides have been made, with significant additions to generation capacity, successful implementation of the 'Power for All' initiative, and notable enhancements in both transmission and distribution infrastructure. However, challenges persist, particularly in achieving 100% metering and reducing line losses and commercial losses. Transmission and Distribution (T&D) losses, representing the percentage of energy lost during electricity transportation, remain a concern. The introduction of Aggregate Technical & Commercial (AT&C) losses assessment in the 1990s has provided insights into energy and revenue loss scenarios at the distribution level, emphasizing the need for targeted interventions. Prioritizing energy audits of 11 kV lines and Distribution Transformers (DTs) is crucial for identifying and addressing the sources of losses effectively. This paper explores the challenges associated with conducting energy audits in the distribution sector and proposes potential remedies to address them.

Keywords:

Transmission, Distribution, Transformers