6th International Conference on

Engineering Science and Technology and Management (ICESTM-2025) Volume-1

General Chair

Dr. Gangineni Dhananjhay

Convener Chair

Dr. Akhib Khan Bahamani

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6th International Conference on Engineering Science and Technology and Management (ICESTM-2025)

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Editors

Dr. Gangineni Dhananjhay

Dr. Akhib Khan Bhamani

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The following are the different tracks in this conference:

Track 1: Electronics and Communication Engineering

Topics of interest but are not limited to the following:

1. Nanoelectronics and microelectronics
2. Power and Applied electronics
3. Microprocessor and Microcontroller
4. Very Large Scale Integration (VLSI)
5. Micro scale fabrication
6. Electro technologies
7. High Voltage and Insulation Technologies
8. Power Electronics and Drive Systems

Track 2: Computer Science and Engineering

Topics of interest but are not limited to the following:

1. Computer Networks.
2. Data Communications.
3. Data Encryption.
4. Data Mining.
5. Database Systems.
6. Programming Languages.
7. Image processing and Pattern recognition
8. CAD-CAM.

Track 3: Electrical and Electronics Engineering

Topics of interest but are not limited to the following:

1. Instrumentation
2. Electric Power Generation
3. Electrical Machines and Drive Systems
4. Electromagnetic Transients Programs
5. Digital Signal Processing
6. Microprocessor based Technologies
7. Economic aspects of power quality and cost of supply
8. Reliability and continuity of supply.

Track 4: Mechanical Engineering

Topics of interest but are not limited to the following:

1. Industrial Planning
2. Maintenance Engineering
3. Intelligent Mechatronics
4. Robotics
5. Automation, and Control Systems
6. Intelligent System
7. Fault diagnosis
8. Engines and Heat exchangers

Track 5: Civil Engineering

Topics of interest but are not limited to the following:

1. Advanced Concrete Technology
2. Concrete Science and Technology
3. Construction Planning, Scheduling, and Control
4. Geology
5. Mechanics of Solids and Fluids
6. Monitoring of Structures & Buildings
7. Architecture and Town Planning

Track 6: Mathematics

Topics of interest but are not limited to the following:

1. Probability & Statistics
2. Number Theory & Linear Algebra
3. Mathematical Modeling and Simulation
4. Graph Theory
5. Geometry Analysis and Fluid Mechanics
6. Computational Methods in Fluid Dynamics

Track 7: PHYSCIS AND CHEMISTRY

Topics of interest but are not limited to the following:

1. Thin Film & Characterization

2. Single Crystals & Applications
3. Semiconductor Devices
4. Polymers, Glasses & Ceramics
5. Photonic Materials
6. Graphene & Novel Materials
7. Nano Chemistry
8. Metal Alloys & Composite Structures
9. Green Chemistry
10. Electroplating
11. Catalysis
12. Biomedical Applications of Polymers

TRACK 8: Emerging Trends in Business & Commerce

Topics of interest but are not limited to the following:

1. Creative and Innovation in Business
2. Finance, Economics and Insurance
3. Accounting and Banking
4. Internet Banking and Marketing Management
5. Entrepreneurship and Sustainable Development
6. Supply Chain Management
7. Hospitality and Tourism Management
8. Stress Management Quality Control and Product Development
9. Environmental Protection and Disaster Management

TRACK 9: Emerging Trends in Economics & Statistics

Topics of interest but are not limited to the following:

1. Pedagogy of Economics
2. Innovative Practices of Economic
3. Interface between Economics and Mathematics
4. Key issues in Gender Economics
5. Nature of Economics
6. Modern Technique in Statistical Methods, Qualitative & Quantitative

REGISTRATION PROCESS

- send the paper to icestm2025@gmail.com
- After the acceptance mail received, complete the payment process.
- The registration fee is payable through crossed Demand Draft (DD) in the favour of "Principal Narayana Engineering College, Nellore", Payable at Nellore.

GUIDELINES FOR AUTHORS

- All submissions will be peer reviewed by experts in the field based on originality, significance, quality and clarity and it should be result oriented.
- All contributions must be original, should not have been published and should not be intended to be under review elsewhere during the review period.
- At least one author must register and present his/her accepted manuscript in the conference. Registration fee includes proceedings, Conference kit, Lunch, Tea& Certificate.
- Prior to submission, the paper should be checked for Plagiarism from licenced plagiarism software like Turnitin / iThenticate. The similarity content should not exceed 20% in any case (either self-contents or others).
- All the accepted manuscripts have an opportunity to be published in UGC CARE and Scopus indexed journal. Additional publication charges are applicable as per journal norms

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ABOUT NARAYANA ENGINEERING COLLEGE

Narayana Engineering College Nellore (NECN) was established in 1998. Now, ours is one of the premier Engineering Colleges in the self-financing category in Andhra Pradesh. College is locating in Nellore city, which is famous for Paddy crop and is also called city of Education. Institution has well-equipped built-up area with impressive infrastructure like state of art Laboratories, class rooms, tutorial rooms, library, drawing halls, seminar halls etc are available to provide conducive environment for academic activities.

College is ranked by Grade 'A' by Government of Andhra Pradesh, permanently affiliated to JNTUA, Ananthapuramu, recognized by UGC 2(f) and 12(B), Accredited by 'A+' grade with 3.41 CGPA by NAAC and certified by ISO 9001:2015. NECN, over the past 21 years has become a shrine of knowledge and shaped thousands of famous and adroit graduates and post graduates, who are successful in their careers, serving all over the world. Since the inception, NECN is intended to provide quality education through value-based teaching-learning process via Outcome Based Education, providing fruitful industry –institute interaction, excelling support in research initiatives among students and faculty members, encouraging to involve in innovation and incubation cell to drive towards entrepreneurship and motivating to participate in community service activities. The institute is always focusing on overall development of the students through participation in co-curricular and extra-curricular activities. NECN is committed to bringing out the best in every student by imparting a strong educational foundation. Given the dynamic and global nature of education in the 21st century, we are constantly working hard and reinventing ourselves with the ultimate goal of creating exceptional and enriching student experiences.

MAJOR ACHIEVEMENTS OF COLLEGE

- Autonomous Institutions
- Accredited with NAAC A+ Grade in Andhra Pradesh, No.3 In India wide
- Permanent Affiliation with JNTUA, Anantapuramu
- Best Engineering College in Co-Curricular Activities
- Recognized by UGC under 2(f) & 12(B).
- Rated as College with Grade-A by Govt. of AP.
- Authorized Training Partner to NSDC, New Delhi as PMKVY-TI Center
- Authorized Nodal Centre from IIT-Bombay
- Offering consultancy services to Major Government and Private Organizations – Testing / Evaluation / Design

ABOUT THE CONFERENCE

6th International Conference on Engineering Science, Technology and Management (ICESTM-2025), which will be held at Narayana Engineering College, Nellore, Andhra Pradesh, on 14th – 15th April 2025. In the contemporary era of knowledge, higher education institutions play a pivotal role beyond traditional teaching. They actively engage in the assimilation, generation, and dissemination of knowledge. The 6th International Conference on Engineering Science, Technology and Management (ICESTM-2025) aims to bring together leading experts, researchers, and innovators from academia, research and development organizations, and industry. The conference will serve as a dynamic platform for sharing cutting-edge research, discussing emerging ideas, and exploring collaborative opportunities across disciplines. ICESTM-2025 is committed to fostering a culture of interdisciplinary research and inspiring young graduates to pursue careers in research and innovation. Join us in Nellore to be part of this knowledge-driven event that bridges academic research and industrial innovation.

Message from founder

It is a matter of immense pride that Narayana Engineering College, Nellore is hosting the 6th International Conference on Engineering Science, Technology and Management (ICESTM-2025) from 14th to 15th April 2025.Research is an indispensable pillar of any esteemed academic institution. I am delighted to announce that NECN has taken a significant step in nurturing a vibrant research culture as part of its academic mission, with the aim of contributing valuable knowledge to the global community. This conference provides a vital platform for interaction and collaboration among scientists from R&D institutions, academicians from universities, and industry technocrats. It serves to sharpen research acumen and bridge the gap between theoretical advancements and their practical applications.

I extend my heartfelt congratulations to the organizers and participants. I wish the event resounding success and hope it paves the way for many future innovations.

Best wishes,

Dr. P. Narayana

Founder, Narayana Group of Educational Institution

Message from Chairmen

I am very glad that Narayana Engineering College, Nellore is organizing the 6th International Conference on Engineering Science, Technology and Management (ICESTM-2025) from 14th to 15th April 2025. It is a great pleasure to welcome academicians, research scholars, and other participants to this two-day international conference. ICESTM-2025 offers a valuable platform for meaningful interaction among academicians, researchers, and industry professionals, fostering opportunities for future collaborations. It also presents a golden opportunity for the students of our institution to broaden their horizons and enrich their academic knowledge.

I extend my best wishes for the grand success of the conference and congratulate the organizing team for their commendable efforts in making this event a reality.

Best regards,

Sri. Puneeth

Chairmen, Narayana Group of Educational Institution

Message from Registrar

It gives me immense pleasure and a great sense of privilege to welcome you to the 6th International Conference on Engineering Science, Technology and Management (ICESTM-2025), being held from 14th to 15th April 2025, organized by Narayana Engineering College, Nellore.

This conference aims to address the challenges faced by researchers, professionals, and students by providing a platform to share innovative ideas, explore recent trends, and discuss future directions in the fields of Engineering, Science, and Technology.

I am confident that ICESTM-2025 will open new avenues in emerging and interdisciplinary domains. The exchange of ideas among scholars and intellectuals will undoubtedly lead to novel solutions and stimulate fresh thinking in tackling complex problems across these fields.

Wishing all participants a fruitful and enriching experience, and the conference a grand success.

Warm regards,

Sri R Samba Siva Rao
Registrar, Narayana Group of Educational Institution

Message from Director

It gives me immense pleasure to pen this foreword for the proceedings of the 6th International Conference on Engineering Science, Technology and Management (ICESTM-2025), being held from 14th to 15th April 2025, organized by Narayana Engineering College, Nellore.

The essence of engineering lies in the practical application of scientific and mathematical knowledge gained through study, experience, and practice for the efficient use of materials and the forces of nature. In this context, research becomes the embellishment of innovation, driving the evolution of ideas into impactful solutions. I am proud to share that NECN has undertaken the vital responsibility of fostering a strong research culture, as part of our academic commitment to generating and disseminating knowledge to the global community. ICESTM-2025 provides a vibrant forum for interaction among scientists from R&D organizations, academicians from universities, and technocrats from industry. It facilitates skill enhancement and the bridging of gaps in the application of technology through meaningful collaboration and dialogue.

I extend my heartfelt best wishes to all participants and organizers. May this event be a grand success and a source of inspiration for all involved.

Warm regards,

Dr. B. Dattatraya Sarma

Director, Narayana Group of Educational Institution

Message from Principal, NEC::Nellore

It is indeed heartening to know that Narayana Engineering College, Nellore is organizing the 6th International Conference on Engineering Science, Technology and Management (ICESTM-2025), to be held from 14th to 15th April 2025. This conference aims to provide a dynamic platform for researchers, academicians, and industry experts to interact, share ideas, and explore new frontiers of knowledge. In an era marked by global interdependence and intense competition, it is imperative that we equip our young minds with quality education and training. At Narayana Engineering College, we have long embraced the tradition of delivering excellence in technical education. It is truly inspiring to witness the institution's remarkable growth over the past two decades, emerging as one of the premier engineering colleges not only in the state but also across India.

However, the pursuit of excellence is a continuous journey. Our collective efforts must be channeled toward the holistic development of the college in all aspects of modern technical education. Furthermore, it is vital that advancements in technology and research outputs are aligned with the betterment of humanity and contribute meaningfully to society.

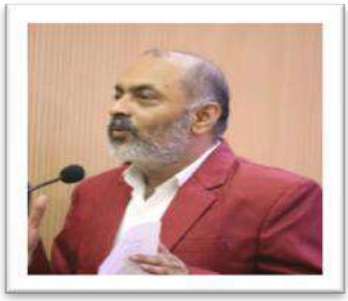
I convey my blessings and best wishes to all members of Narayana Engineering College. I also extend my heartfelt congratulations to the organizing committee of ICESTM-2025 for their commendable efforts in hosting this significant event.

With warm regards,

Dr. G. Srinivasulu Reddy

Principal, Narayan Engineering College, Nellore

Message from the General chair- ICESTM 2025, NEC::Nellore



Dear Participants,

It is a great pleasure to extend a warm welcome to all delegates attending the 6th International Conference on Engineering Science, Technology and Management (ICESTM-2025), being held from 14th to 15th April 2025 at Narayana Engineering College, Nellore. At NECN, it is a regular practice to organize a wide range of academic and professional events such as workshops, symposiums, seminars, and conferences with the aim of enhancing the overall development and performance of our students. ICESTM-2025 is yet another step in this direction, aimed at fostering innovation, knowledge sharing, and collaboration among participants from academia and industry.

On behalf of the organizing committee, we are delighted to welcome you all to this prestigious event. We extend our heartfelt greetings to all distinguished delegates, researchers, academicians, and industry experts. It is a true honor and privilege to serve as the General Chair of this conference.

I eagerly look forward to your active participation and enriching discussions at ICESTM-2025.

Warm regards,

Dr. Gangineni Dhananjhay
Professor & Dean,
General Chair-ICESTM-2024

Message from the Convener chair- ICESTM 2025, NEC::Nellore

Dear Professors and Researchers

It is my privilege and honor to welcome you all to the 6th International Conference on Engineering Science, Technology and Management (ICESTM-2025), being held at Narayana Engineering College, Nellore, from 14th to 15th April 2025. The primary objective of this conference is to provide a vibrant platform for sharing and enriching knowledge in this fast-evolving Information Era. ICESTM-2025 offers a valuable opportunity for individuals passionate about technological advancements to both gain insight into current developments and contribute their own innovative ideas. This conference is designed to promote the exchange of novel concepts and research findings through paper presentations and keynote addresses that spotlight cutting-edge trends in technology, particularly in Industry and Intelligent Computing Systems. It highlights the increasing significance of these domains and their growing impact on academic research and industrial practices. Participants will have ample opportunities to broaden their knowledge base, collaborate with peers, and build meaningful professional networks. Beyond the academic discussions, I also hope you take time to enjoy the scenic surroundings and warm hospitality of our campus and the city of Nellore. I would like to extend my sincere thanks to the conference committee for their tireless efforts, and to all authors, reviewers, and contributors for their unwavering support and trust in the vision of ICESTM-2025.

I warmly invite all enthusiasts to take part in this dynamic and celebrated event, which promises valuable exposure and global opportunities for everyone involved.

Dr. Akhib Khan Bahamani

Convener-ICESTM-2024

Message from HOD, Electrical and Electronics Engineering, NEC::Nellore

It gives me immense happiness to share that Narayana Engineering College, Nellore is organizing the 6th International Conference on Engineering Science, Technology and Management (ICESTM-2025) from 14th to 15th April 2025.

I am confident that this conference will serve as a valuable platform for academicians, corporate delegates, and research scholars to present their innovative ideas, share their latest findings, and showcase their technical expertise across emerging research trends in Engineering, Science, and Technology.

I wholeheartedly welcome all the participants and assure you that this conference will be an enriching and memorable experience. I extend my best wishes for the grand success of ICESTM-2025.

Dr. G. Venkateswarlu

HOD EEE, Narayana Engineering College, Nellore

Message from HOD, Computer Science and Engineering, NEC::Nellore

I am honored to serve as the coordinator for the 6th International Conference on Engineering Science, Technology and Management (ICESTM-2025) from 14th to 15th April 2025 at Narayana Engineering College, Nellore. I extend my heartfelt congratulations to all participants who have submitted their papers for this esteemed conference. I trust that the keynote addresses and presentations will provide valuable insights and stimulate fruitful discussions.

Dr. C. Rajendra

HOD, CSE, Narayana Engineering College, Nellore

Message from HOD Electronics and Communication Engineering, NEC::Nellore

In any engineering institution, it is customary and essential to complement academic pursuits with extracurricular activities both technical and cultural that foster holistic development.

As the Conference Chair of the 6th International Conference on Engineering Science, Technology and Management (ICESTM-2025), to be held from 14th to 15th April 2025, it is my privilege and honor to be part of organizing such a significant event at Narayana Engineering College, Nellore.

This conference serves as a platform to bring together researchers, academicians, and professionals from diverse domains to exchange knowledge, ideas, and innovations that address current and future challenges in Engineering, Science, and Technology.

I extend my heartfelt congratulations to all the participants and wish each one of you a successful and rewarding experience at ICESTM-2025.

Dr. K. Murali

HOD, ECE, Narayana Engineering College, Nellore

Message from HOD Civil Engineering, NEC::Nellore

This 6th International Conference on Engineering Science, Technology and Management (ICESTM-2025) from 14th to 15th April 2025 organizing by Narayana Engineering College, Nellore is an attempt to focus the attention of all concerned professionals to discuss at length concerned with the Emerging trends in engineering& technology, to seek solutions wherever possible and identify areas where further research is needed.

Information provided in various papers are reproduced in the proceedings is aimed at benefiting the Engineers and professionals. It is expected that the purpose would be served in a satisfactory manner through in-depth discussion and interaction among participants during the conference. I take this opportunity to record my heartfelt appreciation and gratitude to all the authors, delegates, conference chairman and all others participating.

Prof. K. Venkatalakshmi

HOD, CE, Narayana Engineering College, Nellore

Message from HOD Mechanical Engineering, NEC::Nellore

The 6th International Conference on Engineering Science, Technology and Management (ICESTM-2025), organized by Narayana Engineering College, Nellore, from 14th to 15th April 2025, provides a valuable opportunity for research scholars, delegates, and students to interact, exchange experiences, and share knowledge on the latest applications of technology.

ICESTM-2025 will serve as an excellent international platform for discussing the recent challenges and innovations in Engineering and Technology. The goal of the conference is to foster collaboration and knowledge sharing between researchers, practitioners, and industry professionals from both academia and industry, enabling them to explore cutting-edge developments in their respective fields.

I extend my heartfelt congratulations to all the participants and wish you all the best for a successful and enriching experience at ICESTM-2025.

Dr. A.V.S. Sridhar Kumar
HOD, ME, Narayana Engineering College, Nellore

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SL. NO	TOPIC'S	P. NO
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OPTIMIZED POWER BALANCING IN A THREE-TERMINAL HYBRID AC/DC MICROGRID USING FUZZY LOGIC CONTROL

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ABSTRACT

This work proposes a three-terminal hybrid AC/DC microgrid configuration, consisting of two DC terminals and one AC terminal. The system employs cascaded H-bridge (CHB) converters for interfacing with the AC grid, and dual active bridge (DAB) converters to interconnect the isolated DC buses. To enhance efficiency and reduce the number of power conversion stages and components, the DAB converters are directly linked to the DC rails of the CHB structure. A zero-sequence voltage injection technique is introduced to mitigate imbalances in both grid currents and DC rail voltages. The influence of key control parameters on system stability is thoroughly examined, and simulation results validate the effectiveness of the proposed balancing strategy in both three-terminal and extended five-terminal hybrid microgrid scenarios.

KEYWORDS: Three Termial, CHB, DAB, Zero Sequence Voltage Injection, Fuzzy Logic

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FUZZY LOGIC-CONTROLLED HYBRID ELECTRIC VEHICLE WITH MMC-BASED SRM DRIVE AND DECENTRALIZED BATTERY ENERGY STORAGE

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ABSTRACT

This study investigates a fuzzy logic-based control strategy for a hybrid electric vehicle (HEV) employing a modular multilevel converter (MMC) fed switched reluctance motor (SRM) drive. In the proposed configuration, the MMC is integrated with a full-bridge (FB) converter, whose switching is governed by an intelligent fuzzy control algorithm. The system is modeled and simulated using MATLAB/Simulink to evaluate its performance. Simulation results demonstrate that the proposed control approach effectively reduces harmonic distortion and improves overall power quality. Key performance parameters of the SRM drive—such as phase and line voltages, rotor speed, electromagnetic torque, rotor current, and load torque—are analyzed and compared with those of conventional HEV systems, including those powered by standard current converters and solar PV integration.

KEYWORDS: Hybrid Electric Vehicle, MMC, SRM, Full Bridge Converter, Fuzzy Logic

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HPF REGULATOR-BASED MODELING AND OPTIMIZATION OF MULTI-BUS POWER SYSTEMS WITH DISTRIBUTED GENERATION

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ABSTRACT

This study presents a Hybrid Power Flow Controller (HPFC), a flexible AC transmission system (FACTS) device designed to enhance power quality in multi-bus systems with distributed generation. Positioned between the sending and receiving ends, the HPFC integrates a boost converter to effectively interface renewable energy sources such as photovoltaic and wind systems with its internal capacitor. The proposed configuration enables efficient voltage regulation, signal amplification, and energy conversion. By combining the functionalities of a Dynamic Voltage Restorer (DVR) and an Active Filter (AF), the HPFC is capable of compensating for voltage sags and minimizing power losses. Simulation results confirm that all circuit components operate reliably, demonstrating the HPFC's effectiveness in improving voltage stability and overall power quality in distributed energy networks.

KEYWORDS: Hybrid Power Flow Controller-HPFC, Flexible AC Transmission System

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FUZZY LOGIC-CONTROLLED HYBRID CONVERTER WITH BOOST-DERIVED DUAL DC AND AC OUTPUTS

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ABSTRACT

The conventional circuit and the new boost-derived PWM control method with a hybrid converter for AC and DC output response are simulated using Simulink Power Systems. The simulation results of the conventional and modified systems are compared. The converter demonstrates superior cross-regulation properties under dynamic load changes. A hardware prototype of the modified system is implemented using a PIC 16F84A microcontroller. This model is tested in the laboratory, and experimental results are obtained. The experimental results are then compared with the simulation results.

KEYWORDS: Pulse with modulation-PWM, Peripheral Interface Controller-PIC

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SMART VOLTAGE REGULATION USING ARDUINO-CONTROLLED IOT REACTIVE POWER COMPENSATION

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ABSTRACT

The project is designed to minimize penalty for industrial units using automatic power factor correction unit. In this proposed system, two zero crossing detectors are used for detecting zero crossing of voltage and current. The time lag between the zero-voltage pulse and zero-current pulse is duly generated by suitable operational amplifier circuits in comparator mode is fed to two interrupt pins of a micro controller. It displays time lag between the current and voltage on an LCD. The program takes over to actuate appropriate number of relays from its output to bring shunt capacitors into load circuit to get the power factor till it reaches near unity. The capacitor bank and relays are interfaced to the microcontroller using a relay driver. Furthermore, the project can be enhanced by using thyristor control switches instead of relay control to avoid contact pitting often encountered by switching of capacitors due to high in rush current.

KEYWORDS: Distributed Energy Resources, Arduino UNO, Reactive power control, Power Factor

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WIRELESS CHARGING SYSTEM FOR ELECTRICAL VEHICLE USING TWO RECEIVER COILS

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ABSTRACT

This paper discusses dynamic wireless power transfer as a realistic solution to the range anxiety issue of electric cars and reducing the cost of battery packs. Compared to traditional static wireless charging, dynamic charging transfers power when the vehicle is in motion, but its analysis involves numerous parameters, making it a complicated task. This research puts forward a new concept to advance dynamic wireless charging through the introduction of extra receiver coils, with optimisation in power transfer efficiency. An elaborate mathematical model is established to estimate energy transfer from source to vehicle. The designed system is confirmed by MATLAB/SIMU LINK simulations, reflecting enhanced charging efficiency and performance under real-time vehicle movement conditions.

KEYWORDS: Coils, Electric vehicles, Mutual inductance, Wireless charging systems.

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TRANSMISSION EXPANSION PLANNING FOR NON-CONVENTIONAL ENERGY RESOURCES

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ABSTRACT

The incorporation of unconventional energy sources, including solar and wind energy, into the grid poses challenging issues for transmission expansion planning (TEP). In contrast to traditional power plants, renewable energy sources (RES) are intermittent, non-dispatchable, and tend to be situated in remote locations with poor transmission facilities. This requires drastic changes in conventional TEP approaches to maintain reliable and economical grid operations. This paper introduces a holistic framework that integrates multiple-objective optimization with production cost modeling to solve complex challenges. The methodology takes into account both technical limitations and economic considerations (investment expense, operational cost savings, and policy-mandated renewable portfolio standards). One of the crucial elements of the study is assessing various scenarios of penetration of renewable energy to identify ideal transmission line upgrades or new installations to ensure adequate capacity for transporting power from remote renewable-abundant areas to high-load load centers. Further, a cost-benefit study is performed to evaluate the financial viability of the expansion plans, balancing initial infrastructure investments with long-term advantages such as lowered generation costs, lower emissions, and better grid reliability. By combining optimization methodologies and scenario planning, this approach offers a sound strategy for building transmission networks for large-scale renewable integration that is still economically and operationally efficient.

KEYWORDS: Renewable Energy Integration, Transmission Expansion Planning, Multi-Objective Optimization, Solar and Wind Power, Grid Reliability, Cost-Benefit Analysis, Sustainable Power Systems

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VOLTAGE FLUCTUATION ALARM SYSTEM FOR AGRICULTURAL IRRIGATION MOTORS USING GSM

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ABSTRACT

This project aims to build a system that monitors voltage and provides a breakpoint based low and high voltage tripping mechanism that avoids any damage to the load. Various industrial and domestic systems consist of fluctuation in the AC mains supply. There is a chance of damaging electronic devices that are quite sensitive to these fluctuations. So there needs to be a tripping system that avoids any damage to these loads. This system also includes Arduino microcontroller which finds out the voltage level which is displayed on the LCD screen. This microcontroller not only finds out the voltage level but also send SMS via GSM modem which alerts the user whenever the voltage level is crosses the limits. Our system consists of a tripping mechanism that monitors the input voltage and trips according to limits provides. This trigger then operates a relay that cuts off the load to avoid any damage to it. Well the system is also configured with an alarm that goes on as soon as tripping takes place.

KEYWORDS: Voltage Fluctuation, GSM Alert, Motor Protection, and Power Safety, Overvoltage & Under voltage.

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OPTIMAL SITING OF DG FOR VOLTAGE IMPROVEMENT USING STATCOM AND RES

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ABSTRACT

The integration of photovoltaic (PV) inverters into power distribution networks as static synchronous compensators (PV-STATCOM) during nighttime operation has emerged as a promising strategy for enhancing grid performance. This study focuses on the optimal allocation of PV-STATCOM units to minimize power losses and improve voltage profiles across the network, taking into account 24-hour load demand variations. The effect of deploying varying numbers of PV-STATCOM devices is examined to evaluate their influence on system performance. In particular, the use of Virtual STATCOMs has proven effective in stabilizing voltage at weak buses within an eight-bus distribution system. This work presents the modeling and simulation of a closed-loop controlled three-phase voltage source inverter (VSI) functioning as a Virtual STATCOM, demonstrating its capability to enhance voltage regulation and overall network reliability.

KEYWORDS: STATCOM- Static compensator PV-Photo voltaic

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MPC-CONTROLLED HYBRID SOLAR AND BATTERY STORAGE SYSTEM WITH MMC TECHNOLOGY

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ABSTRACT

This paper presents a Model Predictive Control (MPC)-based strategy for a Hybrid Modular Multilevel Converter (MMC)-integrated Photovoltaic (PV) and Battery Energy Storage System (BESS). The proposed control approach optimizes power management, ensuring stable grid integration and enhanced dynamic performance. The MMC topology offers superior scalability, reduced harmonics, and improved fault tolerance, making it an ideal choice for renewable energy applications. The MPC strategy enhances voltage balancing, stability and optimally distributes power between PV and BESS, improving overall system efficiency. A detailed MATLAB-based simulation validates the effectiveness of the proposed system, demonstrating improved power quality, transient response, and operational flexibility. The results confirm the feasibility of MPC-controlled hybrid MMC technology for future smart grid applications.

KEYWORDS: Model Predictive Control, Modular Multilevel Converter, Photovoltaic System, Battery Energy Storage, Hybrid Renewable System, Power Quality.

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MICROGRIDS IN VARIABLE LOADING CONDITIONS USINGRFID TECHNOLOGY

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ABSTRACT

The Microgrids represent a pivotal innovation in modern energy systems, enabling localized power generation, distribution, and consumption with enhanced reliability and sustainability. Their ability to operate in both grid-connected and islanded modes makes them particularly valuable in integrating renewable energy sources. However, the dynamic nature of variable loading conditions driven by fluctuations in energy demand, the intermittent nature of renewable energy sources such as solar and wind, and uncertainties in grid connectivity—poses significant challenges to their operation and stability. This paper presents an in-depth exploration of microgrid performance under variable loading conditions, addressing key challenges such as maintaining power quality, ensuring voltage and frequency stability, and optimizing energy flow between distributed energy resources (DERs) and loads. The study highlights the importance of accurate load forecasting, advanced energy. By addressing the complexities of variable loading conditions, this paper contributes to the development of robust frameworks for microgrid optimization and long-term reliability.

KEYWORDS: Hardware Development Kit, Electric Vehicles, RFID Reader, Ardunio, Solar Pannel Inverter.

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MODIFIED HYBRID CONVERTER ARCHITECTURE FOR SMART GRIDS EMPLOYING SOLID-STATE TRANSFORMERS

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ABSTRACT

This paper presents a novel multi-input DC/AC converter based on the principle of magnetic flux addition. Unlike traditional methods that combine input DC sources electrically, the proposed converter integrates multiple sources magnetically by summing their magnetic fluxes within the core of a coupled transformer. The system employs phase-shifted pulse-width modulation (PWM) to efficiently manage power flow from two independent DC sources, enabling either individual or simultaneous power delivery to the load. Detailed analysis of the converter's operating principles confirms that output voltage regulation and power sharing can be effectively controlled through phase-shifted PWM techniques. A prototype using two different DC voltage inputs has been successfully developed, simulated in MATLAB/Simulink, and implemented using an embedded controller, demonstrating the practical viability and performance of the proposed design.

KEYWORDS: Pulse Width-Modulation (PWM), Multi-input Dc/Ac converter, coupled transformer

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MODELING AND SIMULATION OF HYBRID POWER SYSTEM

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ABSTRACT

Energy Generation poses a major challenge for both developing and developed nations. The gap between supply and demand creates issues, as Energy Consumption always exceeds Energy production. Renewable Energy sources now play a crucial role to bridge this gap between energy generation and use. People can now find Photovoltaic Solar panels and wind generators to help save non-renewable resources. The depletion of Non-renewable Energy sources also brings about environmental problems. So, it's time to switch from non-renewable power sources to renewable ones in a way that makes the most of power from renewable resources without hurting the power system. We need a smart power system that can tap into electrical power from renewable resources and uses non-renewable power when renewable power isn't available or can't meet the demand. This forms the main job of a hybrid Power Network. A hybrid power system therefore, is an electrical grid that includes many different operations and energy measures such as smart meters smart appliances renewable energy resources, and energy-efficient resources. This paper links various kinds of energy sources, including non-renewable and renewable ones. It uses the MATLAB Simulink Tool Box to run simulations.

KEYWORDS: Energy Consumption, Renewable Energy, Non-renewable Energy, Power system, MATLAB Simulink Tool Box.

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POWERFLOW AND STABILITY ANALYSIS OF THREE-PHASE POWER SYSTEM WITH WIND POWER USING UNIFIED POWER QUALITY CONDITIONER

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ABSTRACT

The Unified Power Quality Conditioner (UPQC) is one of the Custom Power devices (CP), and it mitigates both load current and supply voltage problems (voltage swells, sags, harmonics, etc.) simultaneously. By using CP, we are getting more familiar with renewable energy's high penetration on the electrical grid because of its intermittent nature, which causes power flection. We are also using powered electronic devices, and non-linear loads produce harmonics that affect the voltage and current waveform. In this paper, a UPQC will be used with a sensitive load that is connected to a grid (grid–wind turbine) power system. The UPQC will operate under different disturbances such as phase-to-ground fault, non-linear load on the grid side, and non- linear load in parallel with the sensitive load, using pulse-width modulation and hysteresis as switching techniques.

KEYWORDS: Unified Power Quality Conditioner (UPQC), Pulse-Width Modulation (PWM), Hysteresis, Total Hormonic Distortion (THD), Wind Turbines.

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EXPEXPERIMENTALSTUDYONMECHANICALPROPERTIESOF SILICA FUME AND RECYCLED COARSE AGGREGATES WITH PARTIAL REPLACEMENT OF CEMENT AND COARSE AGGREGATES IN M25 GRADE OF CONCRETE

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ABSTRACT

This project presents the results from an experimental investigation into the mechanical properties of M25 grade concrete, incorporating silica fume and recycled coarse aggregate as partial substitutes for cement and coarse aggregate. The increasing interest in using recycled coarse aggregates in fresh concrete as a replacement for natural aggregates stems from their potential environmental and economic advantages. The study commenced with the collection of raw materials for concrete preparation, adhering to the specified quantities derived from the concrete mix design. A series of tests were performed on the raw materials, including assessments of fineness, specific gravity, normal consistency, initial and final setting times of cement, sieve analysis for both fine and coarse aggregates. Following the mix design, the materials were combined and placed into moulds in three layers, with each layer being tamped 25 times.

The moulded cubes were demoulded the following day and submerged in a curing tank for periods of 7, 14, and 28 days. After the 7-day curing duration, the specimens underwent compression testing to ascertain the load values at which failure occurred. Similar tests were conducted on cubes cured for 14 and 28 days. The mixes were formulated using varying proportions of silica fume and recycled coarse aggregate, and the results were documented and illustrated in a bar graph. The experimental findings indicate that silica fume enhances the mechanical properties of concrete and its capacity to fill voids between cement particles. Consequently, the integration of recycled coarse aggregate and silica fume in concrete production holds promise for enhancing both the sustainability and performance of concrete.

KEYWORDS: Recycled Concrete Aggregates, Mechanical Properties, and Silica fume.

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A COMPARITIVE INVESTIGATION AND DESIGN OF BUILDING COMPONENTS BY USING STAAD PRO, ANALYSIS

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ABSTRACT

One of the major problems facing by the INDIAN country is rapid growth of population which restricted the availability of the land. Moreover, even the available houses are let out at abnormal rent Charges. Hence an apartment building is proposed in this project. As per we know the strength of the building or apartment is fully depends upon the structures. For knowing about the structures, we should undergo on site investigation. This project we are going to study about the structural elements, on ongoing construction of G+4 Building located at Santha Peta, Nellore- 524004. The analysis of structural element was done by using the software analyzing as well as IS-456:2000 CODE of practice for reinforced cement concrete. Subsequently we are going to consider one outer column for design by using STAAD pro software and comparing of reinforcement details which is provided at site. After having design, the result & conclusion were made in this project. The project is to develop independent and creative thinking fundamental, theoretical knowledge. We obtain during the course of the study practical application of field. So that, we have the ability to learn about the design, on site construction of structures.

KEYWORDS: Key words: G+4 Building, STAAD pro software, Reinforcement detailing.

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DYNAMIC TRAFFIC CONTROL FLOW SYSTEM BY USING IOT

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ABSTRACT

Traffic congestion in urban areas has become a significant challenge due to rapid urbanization and the increasing number of vehicles. Conventional traffic management systems rely on fixed-time signals, which fail to adapt to fluctuating traffic conditions, leading to inefficiencies such as longer wait times, fuel wastage, and increased carbon emissions. To address these issues, this paper proposes a Dynamic Traffic Control Flow System Using IoT, which intelligently manages traffic signals based on real-time traffic data. The system employs IoT-enabled sensors, including Radio Frequency Identification, infrared (IR), ultrasonic sensors, and AI-powered cameras, to monitor vehicle flow at intersections. The collected datais transmitted to a central cloud-based system, where machine learning algorithms analyze traffic patterns and dynamically adjust traffic signal durations. The system prioritizes high-density lanes and optimizes green light durations to ease congestion. Additionally, it incorporates emergency vehicle detection to provide instant clearance and adaptive rerouting mechanisms for better traffic distribution. One of the key advantages of this system is its scalability and cost-effectiveness, making it suitable for integration with existing traffic infrastructure.

KEYWORDS: IoT, Dynamic Traffic Control, Smart Traffic Management, Real-time Traffic Monitoring, Machine Learning, Smart Cities, Cloud Computing, V2I Communication.

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TO INVESTIGATE THE CATCHMENT AREA OF FLOOD MONITORING AND WARNING SYSTEM BASED ON IOT SENSOR SYSTEM

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ABSTRACT

Floods are major natural disaster that can cause significant damage to infrastructure, agriculture, and human life. Effective flood monitoring and warning systems (FMWS) are essential to mitigate the impact of flooding. The increasing frequency and severity of flood events due to climate change necessitate the development of innovative solutions for flood risk management. The innovative, cost-effective, and user-friendly FMWS employs an HC-SR04 ultrasonic sensor with an Arduino microcontroller to measure flood levels and determine their status. The Internet of Things (IOT) is a rapidly growing technology that is transforming the way we live and work. IoT refers to the network of physical devices, that are embedded with sensors, software, and other technologies to connect and exchange data with other devices and systems over the internet. The data regarding flood levels and associated risk levels are updated on The Things Network and integrated into TagoIO and Thing Speak IoT platforms through a custom built long-range wide area networks (LORAWAN) gateway.

KEYWORDS: LORAWAN, IoT, Flood Warning System, HC- SR04 Ultrasonic Sensor, Arduino Microcontroller, TagoIO and Thing Speak.

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SMART IRRIGATION SYSTEM USING IOT TECHNOLOGY

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ABSTRACT

As there is rapid increase of population now-a-days need of water consumption increases which leads to the depletion of water resources, so we are opting IoT-based water management systems to limit the usage of water. In the case of traditional irrigation system, water saving is not considered. Since, the water is irrigated directly in the land, plants undergo high stress from variation in soil moisture, therefore plant appearance is reduced. A system to monitor moisture levels in the soil was designed. IoT water management systems use sensors, controllers, meters, and other devices connected to system, and data processing and analysis tools to efficiently manage water supply, monitor water quality. This system reduces the energy and cost. Also irrigation systems that uses oil moisture sensors to optimize water usage. These system scan be applied in various sectors, including agriculture, urban management, and water treatment plants. The automated system utilizes a soil moisture sensor to continuously monitor the moisture level in the soil. Once the moisture level falls below a predefined threshold, the sensor triggers the Arduino Uno to activate a water pump, ensuring timely and precise irrigation for plants or crops.

KEYWORDS: Arduino Uno Mirco Controller, Relay Module, Smart Irrigation, Soil Moisture Sensor, Submersible water pump.

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OPTIMIZING SOLAR SYSTEM EFFICIENCY THROUGH ACCURATE REAL-TIME ENERGY DATA ANALYSIS AND SUN POSITION TRACKING

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ABSTRACT

The Internet of Things (IoT) is playing an increasingly vital role in our global society by helping to achieve various objectives. As global temperatures continue to rise, there is a growing shift towards alternative energy sources, particularly solar energy, which can be effectively utilized in numerous applications. Regular maintenance and advancements in solar systems can lead to significant savings on electricity costs. The IoT enables real-time monitoring of solar energy systems from any location, enhancing both efficiency and reliability. This study focuses on boosting the efficiency and reliability of solar power generation by integrating sensors, microcontrollers, and IoT technologies to monitor solar panel performance, track the sun's movement, and calculate energy output. Additionally, the system features a user interface that provides real-time data on solar panel performance and energy production. The proposed solution promises higher efficiency, increased energy output, and improved reliability, making it a compelling option for widespread adoption in the renewable energy sector.

KEYWORDS: IOT, solar energy, real time monitoring

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LOW-POWER 12T SRAM WITH MULTI-NODE SOFT ERROR CORRECTION FOR RADIATION HARDENED PURPOSES

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ABSTRACT

The primary goal of this project is to develop an advanced SRAM (Static Random Access Memory) design specifically for aerospace applications, where low power consumption and high reliability are essential. Traditional memory systems often struggle with radiation-induced upsets, particularly in high-altitude and space environments. To address this, we introduce a novel 12T SRAM cell that features dual-node upset recovery mechanisms, allowing the system to detect and correct single-event upsets (SEUs) without incurring significant power overhead. This innovative design enhances energy efficiency by reducing power consumption during both active and standby modes, effectively meeting the stringent energy requirements of aerospace systems. By integrating advanced radiation-hardening techniques and fault-tolerant methods, such as error correction coding (ECC) and redundancy, the SRAM ensures data integrity and resilience against radiation effects. Additionally, the design incorporates power optimization strategies, including dynamic voltage scaling, power gating, and low-leakage transistors, to further minimize energy consumption while maintaining robust performance. Overall, this project aims to deliver a reliable and energy-efficient memory solution for the demanding conditions of aerospace applications.

KEYWORDS: 12T SRAM, Low Power Consumption, Radiation Hardening, Single-Event Upsets (SEUs).

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ONLINE VOTING SYSTEM POWERED BY BLOCK CHAIN TECHNOLOGY

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ABSTRACT

The rapid evolution of digital technologies has facilitated the development of secure and transparent online voting systems. However, traditional e-voting methods often face vulnerabilities related to security breaches, data manipulation, and a lack of transparency. Blockchain technology provides a decentralized, tamper-proof, and verifiable solution to these issues. This paper introduces a Blockchain-Enabled Online Voting System (BEOVS) designed to ensure data integrity, transparency, and voter anonymity while reducing the risks of election fraud. The proposed system utilizes smart contracts for automated vote validation, distributed ledger technology for real-time auditability, and cryptographic techniques for voter authentication. By removing the dependence on centralized authorities, the system fosters greater trust and confidence in electoral processes. A comparative analysis between traditional voting methods and blockchain-based voting reveals significant enhancements in security, efficiency, and accessibility. The implementation of this system has promising implications for democratic processes, allowing for remote, verifiable, and tamper-resistant elections.

KEYWORDS: Blockchain, Online Voting, Smart Contracts, Security, Decentralized Voting, Cryptography

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DESIGN AND PRODUCTION OF AN ENERGY SOURCE THAT PRODUCES ELECTRICITY BY REPLACING CONVENTIONAL SPEED BREAKERS

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ABSTRACT

The objective of this project is to design and manufacture an energy source that generates electricity by replacing standard speed bumps with an innovative mechanism known as a speed breaker power generator. As vehicles pass over these modified speed breakers, the weight of the vehicle causes the speed breaker to compress, generating energy through a mechanism located beneath it. This approach represents a non-conventional energy source with relatively low fabrication costs. The report details the various stages of research, design, and manufacturing involved in creating the speed breaker power generation system. It provides an in-depth explanation of the efficient mechanisms employed, including the rack and pinion system, as well as the construction of essential components such as springs, the rack and pinion arrangement, and the generator itself.

KEYWORDS: Speed Breaker Power Generator; Rack and Pinion Mechanism; Electricity Generation; Vehicle Weight Utilization

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ENHANCING CROP PROTECTION FOR SUSTAINABLE AGRICULTURE

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ABSTRACT

The primary goal of the project "Advancing Crop Protection for Sustainable Agriculture" is to improve the safety and productivity of agricultural environments through automation and real-time monitoring. This system utilizes a combination of technologies, including an Arduino Uno, GSM module, ESP8266 WiFi module, and various sensors, to protect crops and optimize farming conditions. Key features of the project include: Animal Detection A laser-based sensor system detects the presence of animals and sends an SMS notification within 15 seconds via the GSM module. Soil Moisture Monitoring: soil moisture sensor continuously tracks soil conditions and automatically activates a water pump when moisture levels fall below a specified threshold. Weather Monitoring: A rain sensor monitors rainfall, while a Light Dependent Resistor (LDR) automatically turns on lights during low-light conditions to protect crops from extreme weather. Fire Safety: A fire sensor is connected to the water pump, activating it in the event of fire detection to help mitigate potential damage. The integration of the ESP8266 WiFi module enables remote monitoring and control, allowing farmers to stay informed and manage their crops efficiently from anywhere. This project aims to enhance agricultural practices, fostering a more secure, automated, and responsive farming environment.

KEYWORDS: Arduino Uno, GSM module, ESP8266 WiFi module, soil moisture sensor and Fire sensor

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IDENTIFICATION OF BLOOD CANCER USING MACHINE LEARNING

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ABSTRACT

This project centers on the detection of blood cancer using advanced image processing and machine learning techniques. Blood cancer, which encompasses conditions like leukemia and lymphoma, poses significant health risks and necessitates timely diagnosis for effective treatment. By utilizing publicly available datasets of blood smear images, this study employs various image processing methods to enhance and segment blood cells. Machine learning algorithms, particularly Convolution Neural Networks (CNNs), are implemented to classify images and identify abnormalities that may indicate cancer. The goal of the project is to enhance diagnostic accuracy and reduce the time needed for detection, thereby aiding healthcare professionals in making informed decisions. Furthermore, this work emphasizes the integration of electronics and communication engineering principles with medical applications, demonstrating how technological advancements can facilitate early cancer detection and improve patient outcomes. The findings from this project could pave the way for further research in automated diagnostics and real-time monitoring of blood-related diseases.

KEYWORDS: Blood Cancer Detection, Image Processing, Machine Learning, Convolutional Neural Networks.

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AUTOMATIC IDENTIFICATION OF GENETIC DISEASES IN CHILDREN USING PUPILLOMETRY

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ABSTRACT

Inherited retinal diseases (IRDs) can lead to significant visual impairments in children and are categorized into outer and inner retinal disorders, often resulting in childhood blindness. Diagnosing these conditions is complex due to the diverse clinical and genetic factors involved, with over 200 identified causative genes. Traditional diagnostic methods typically rely on a series of intricate clinical tests, some of which may be invasive and unsuitable for infants and young children. To address this challenge, a novel approach utilizing Chromatic Pupillometry is proposed. This technique is gaining traction for evaluating the functions of both the outer and inner retina. The proposed solution integrates specialized hardware and software, employing a dedicated pupillometer alongside a custom-designed machine learning decision support system. The process for the Automatic Detection of Genetic Diseases in Pediatric Patients via Pupillometry consists of three key stages:

1.Data Upload: Raw pupillometry data from pediatric patients is uploaded and preprocessed.

2. Model Training: A machine learning model is trained using the uploaded data, with optimization of model parameters to enhance disease detection accuracy.

3.Prediction: The trained model is then utilized to predict genetic diseases, providing precise predictions to aid clinical decision-making. This technique employs a Random Forest Classifier, a machine learning algorithm used to develop the model, and a Confusion Matrix to assess the classification model's performance.

KEYWORDS: Inherited Retinal Diseases (IRD's), Pupillometry, Machine Learning, Random Forest Algorithm.

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PREDICTING CARDIOVASCULAR DISEASE RISK THROUGH MACHINE LEARNING ALGORITHMS

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ABTRACT

One of the hardest tasks in the medical field is predicting heart disease; thus the early detection of heart disease became a potential area for research to save the life of the patient. Due to poor prediction and delay in taking proper treatment at home, the number of cardiac arrest cases at home has shot up enormously in the pandemic period. Data in the health care industry operates on processing huge amount of data and for this purpose solution avail is machine learning. Data science processes this information to make intelligent decisions for health care, avoiding risk and alerting patients. We are using few attributes to predict the probability of heart disease using the comparative study of various machine learning classifiers based on dataset's. ML algorithms for heart disease prediction is an Support Vector Machine, Multi-Layer Perceptron, Logistic Regression and Random forest algorithm It also identifies the correlation between different attributes thus is able to use them effectively for predicting heart attack.

KEYWORDS: Cardio vascular, Machine learning, Random forest algorithm

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ENHANCING MENTAL HEALTH CARE THROUGH ADVANCED PREDICTIVE TECHNIQUES

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ABSTRACT

Mental health disorders such as Schizophrenia, Bipolar Disorder, and Obsessive-Compulsive Disorder (OCD) present significant diagnostic challenges, often necessitating early detection for effective treatment. Traditional diagnostic methods typically depend on subjective evaluations by healthcare professionals, which can result in delays or inaccuracies. This project aims to create an automated system that leverages machine learning algorithms including Random Forest, Decision Tree, Logistic Regression, and AdaBoost to predict the likelihood of these disorders based on patient-reported symptoms such as mood swings, hallucinations, and compulsive behaviour. The system processes patient data and achieves impressive accuracy, with both the Random Forest and Decision Tree models reaching 99% accuracy in predicting these conditions. By providing a faster and more reliable means of detecting mental health disorders, this system empowers clinicians to make data-driven decisions. The integration of machine learning allows for real-time predictions, significantly reducing reliance on manual assessments. The system proves effective in diagnosing Schizophrenia, Bipolar Disorder, and OCD, highlighting the potential of artificial intelligence to enhance mental health diagnosis and assist clinicians in early identification of these conditions.

KEYWORDS: OCD, Logistic Regression, Bipolar disorder

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SENTIMENT ANALYSIS OF SOCIAL MEDIA

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ABSTRACT

Sentiment analysis plays a crucial role in understanding public opinions on social media. Traditional models often struggle to grasp context, but BERT, a cutting-edge natural language processing (NLP) model, significantly enhances sentiment classification. This project focuses on fine-tuning BERT using a large dataset to categorize sentiments as positive, negative, or neutral. The model is deployed with Flask, enabling sentiment predictions through a RESTful API, and is integrated with a web interface for real-time user interaction. This system improves accuracy, scalability, and accessibility, making sentiment analysis more effective. Users can easily input text via the interface, and the model processes it to provide instant sentiment predictions. This approach creates a seamless and efficient sentiment analysis pipeline, suitable for a variety of real-world applications.

KEYWORDS: Sentiment Analysis, BERT, Natural Language Processing, Flask, Web Interface

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SECURE AND DATA TRANSMISSION IN IOT: A RISC-V PROCESSORFEATURING AES-GCM AND ECC ACCELEROMETER

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ABSTRACT

The rapid growth of Internet of Things (IoT) devices has intensified the demand for secure, efficient, and reliable data transmission. To tackle these challenges, this project proposes a low-power, cost-effective RISC-V processor optimized for IoT applications, featuring an integrated encryption accelerator. This design enhances previous models by replacing the existing hybrid encryption system which utilized SM3 for hashing and SM4 for symmetric encryption with a more advanced cryptographic suite that combines AES-GCM (Galois/Counter Mode) for authenticated encryption and Elliptic Curve Cryptography (ECC) for public-key operations. AES-GCM strikes an ideal balance between strong encryption, authentication, and high throughput, making it particularly suitable for resource-constrained IoT environments. The integration of ECC allows for robust key exchange and management with minimal overhead, as ECC provides equivalent security with smaller key sizes compared to other public-key schemes. Together, these cryptographic primitives significantly enhance data security during transmission while preserving the system's energy efficiency and processing speed.The proposed processor and encryption accelerator are implemented using Verilog HDL, following design principles focused on low power consumption and cost-effectiveness. Simulation results indicate that this updated architecture achieves substantial improvements in encryption security and key management efficiency, with minimal impact on performance and power usage. This makes it an excellent solution for next-generation IoT applications that require enhanced data protection.

KEYWORDS: RISC -V Processor, AES – GCM, Encryption accelerator, Cryptography, Robust

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DESIGN OF AN OPTIMIZED 4-BIT RIPPLE CARRY ADDER USING AN EXACT REVERSIBLE FULL ADDER

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ABSTRACT

The emergence of quantum computing alongside low-power applications has underscored the importance of reversible logic in the creation of energy-efficient circuits. In this study, I introduce the design and execution of a 4-bit ripple carry adder (RCA) utilizing the recently developed Exact Reversible Full Adder (ERFA), achieving a quantum cost (QC) of 9 and an overall delay of 7Δ. The ERFA, composed of 4 Feynman gates and 1 Fredkin gate arranged in three stages, incorporates 2 ancillary inputs (AIs) and 3 garbage outputs (GOs). Using this innovative adder, I enhance its capabilities by constructing a 4-bit RCA through cascading four ERFAs. The functionality of the proposed 4-bit RCA is validated via functional simulations conducted in Verilog HDL. Additionally, the design metrics of the suggested 4-bit RCA are assessed and compared with current reversible RCA designs focusing on quantum cost, delay, and gate efficiency. The findings reveal the benefits of our design in achieving reduced quantum cost and improved gate utilization, positioning it well for applications in quantum and reversible computing.

KEYWORDS: Ripple carry Adder, VerilogHDL, Exact reversibile full adder

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SAFE TRACK: A PERCEPTIVE RAILWAY CRACK MONITORING SYSTEM

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ABSTRACT

In global transportation networks, railway infrastructure is essential. Railway track cracks and fractures present significant safety hazards, increasing the likelihood of derailments and catastrophic incidents. This study introduces a novel method for detecting cracks in railroad tracks using radio frequency (RF) technology. RF receivers located on the train engine and RF transmitters placed along the railroad rails make up the system. When a crack is found, the transmitter signals the receiver, which stops the train automatically, shows a warning on an LCD screen, and sounds a buzzer alarm to notify railroad workers. The suggested approach improves early fault detection, which lowers maintenance costs and increases railway safety. Results from experiments show how effective the technology is at accurately detecting cracks in real time.

KEYWORDS: Railway track monitoring, Crack detection, RF Technology, Automatic train stoppage, Structural health monitoring, Buzzer.

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AN INNOVATIVEMEMS-BASED APPLIENCECONTROL HOME AUTOMATION SYSTEM

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ABSTRACT

A system that enables users to safely operate numerous household appliances with hand gestures is described in this project. Motion in the X and Y axes is detected via a MEMS sensor. A order to turn on or off a related appliance, like a fan or light, is generated by the Arduino when a user walks in a specific direction. For individuals with physical limitations, this project employs MEMS technology to control household appliances. Numerous aspects of a home, such as the lighting, climate, entertainment systems, and appliances, can be monitored and managed by home automation systems. Additionally, they can incorporate home security features like alarm systems and access control. This project investigates the use of Micro-Electro-Mechanical Systems (MEMS) technology in the creation of a home automation system. It is intended to improve

KEYWORDS: MEMS Technology; Arduino IDE

ISBN Number: 978-93-48505-82-8

AUTOMATED MACHINE LEARNING-BASED CYBER THREAT IDENTIFICATION

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ABSTRACT

In contrast to earlier times, advancements in computer technology and correspondence have brought about significant and rapid changes. People, companies, and governments can benefit greatly from the usage of new innovations, but some people are harmed by them. For example, safeguarding important data, securing stored information, making information accessible, and so on. In light of these concerns, one of the biggest problems of our time is digital oppression based on fear. Digital dread, which caused many problems for people and organizations, has reached a point where it could jeopardize national security and openness from various groups, including criminal organizations, skilled individuals, and online activists. Given the rapid expansion of digital data, spotting possible cyber attacks

KEYWORDS: Cyber Threat Detection, Machine Learning, Tweet Analysis, Threat Classification

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DETECTION OF BLOOD GROUPS THROUGH FINGER PRINTS

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ABSTRACT

The fingerprint pattern is the most distinctive and genuine feature that defines a person's identity. Until a person dies, the distinctive pattern remains unchanged and unchangeable. Fingerprint evidence is widely respected in a variety of situations, especially in court. Every individual has a unique pattern of minute details that are unmatched, and the likelihood of likeness is extremely low—nearly one in sixty-four thousand million. This uniqueness is maintained even for identical duplets. An enduring feature of human individuality, the distinctive ridge pattern remains unaltered from birth. The technique presented in this study compares particular fingerprint feature patterns for personal identification systems. The investigation of blood group determination also uses fingerprint data. Ridge is included in the fingerprint matching procedure.

KEYWORDS: Fingerprint Patterns, CNN (Convolution Neural Network), Rigid Frequency, Blood Group Detection.

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ATTENDANCE SYSTEM BASED ON FACE RECOGNITION

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ABSTRACT

A Face Recognition Attendance System is proposed in this project to automate attendance management in workplaces, educational institutions, and professional settings. The device offers a frictionless, sanitary, and effective way to identify people by assessing their facial features in real-time using sophisticated facial recognition technology. It matches faces with a pre-stored database using computer vision and machine learning, reducing human error and accurately recording attendance. By prohibiting proxy attendance, the system guarantees safe data preservation and real-time attendance tracking. It can be scaled for big institutions, produces organized attendance records, and functions in a variety of lighting settings. Data security and privacy are given top priority, and encrypted data is safeguarded. The administrative burden is lessened, transparency is increased, and attendance management efficiency is increased with this approach. It streamlines and is perfect for contemporary offices.

KEYWORDS: Face Recognition, Data Security, Python

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AN IMPROVED PERSONALIZED INTERACTIVE SMART DESK WITH RANDOMLY GENERATED QUESTION DELIVERY BASED ON STUDENT ID

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ABSTRACT

This study presents an updated smart desk system with integrated video streaming and cutting-edge capabilities for a more regulated and engaging learning environment in response to the increased demand for improved classroom administration and security. The ESP32-CAM is used in the suggested system to provide real-time video surveillance, which is transmitted online to a local webpage for ongoing observation. A TFT capacitive touch display for test instructions and question presentation, an RFID tag system for identification, and a sound sensor to identify unwanted communication are all installed on each student workstation. This all-encompassing strategy seeks to increase student engagement, streamline classroom management, and promote exam integrity. All things considered, the suggested system improves user engagement, security, and functionality while resolving the shortcomings of the current system and providing a stronger alternative.

KEYWORDS: Embedded; IoT; ESP32 Cam; Smart Desk

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PERSONAL ASSISTANT SYSTEM

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ABSTRACT

One of the hottest subjects in the modern world is personal assistants, which are programs designed especially to meet the daily communication needs of persons with disabilities. It is a human-computer/device interaction since the program hears human spoken commands and reacts accordingly. These days, voice assistants are commonplace and quite helpful during hectic times. Almost everyone uses voice assistants these days because they are so commonplace. From Google's smartphone assistant, which even five-year-old children can use due to the current global pandemic, to Amazon's Alexa, which is incredibly helpful for tasks ranging from entertainment to complete system control, Its adaptability goes beyond

KEYWORDS: Python, Natural Language Processing

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ESP32 BASED PORTABLE GEMINI TERMINAL

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ABSTRACT

Using the ESP32 microcontroller, this project seeks to create a portable Gemini terminal that allows text and voice input to be used in real-time with Google's Gemini API. The viability of AI-driven IoT devices is demonstrated by this work, which incorporates conversational AI into an inexpensive, low-power embedded system. The terminal addresses important issues in integrating AI on hardware with limited resources by using Python to process voice input and produce speech output. This project opens the door for voice-activated, intelligent devices in IoT ecosystems and demonstrates the potential of embedded systems in conversational AI applications. To ensure smooth data interchange, the system makes use of the ESP32's Wi-Fi capabilities to connect to the Gemini API. Accessibility is improved with text-to-voice conversion and speech recognition made possible by a Python-based interface on a laptop or PC.

KEYWORDS: ESP32, Gemini API; conversational AI; IoT; embedded systems; voice recognition; text-to-speech; low-power computing; AI integration; real-time communication; Python; wireless connectivity.

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VOICE-ACTIVATED SMART ROCKER-BOGIE WHEELCHAIR WITH INTERNET OF THINGS-BASED HEALTH MONITORING

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ABSTRACT

For people with physical disabilities, the Smart Rocker-Bogie Wheelchair with Voice Control and IoT-Based Health Monitoring is intended to improve mobility, safety, and healthcare. In contrast to traditional wheelchairs, this system features a Rocker-Bogie Mechanism that increases adaptability in a variety of settings by enabling steady and easy transit over obstacles, ramps, and uneven terrain. The wheelchair, which is powered by an ESP32 microcontroller, has Bluetooth-based voice control that makes it simple for users to use using voice commands. This eliminates the need for manual handling and improves accessibility for people with severe disabilities. The device continuously monitors critical factors including body temperature and oxygen saturation (SpO_2) by integrating a temperature sensor and pulse oximeter for real-time health monitoring. This ensures user safety and well-being.

KEYWORDS: Rocker-Bogie Mechanism; ESP32 Microcontroller; Ubidots; Arduino IDE

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AN INNOVATIVEMEMS-BASED APPLIENCE CONTROL HOME AUTOMATION SYSTEM

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ABSTRACT

A system that enables users to safely operate numerous household appliances with hand gestures is described in this project. Motion in the X and Y axes is detected via a MEMS sensor. A order to turn on or off a related appliance, like a fan or light, is generated by the Arduino when a user walks in a specific direction. For individuals with physical limitations, this project employs MEMS technology to control household appliances. Numerous aspects of a home, such as the lighting, climate, entertainment systems, and appliances, can be monitored and managed by home automation systems. Additionally, they can incorporate home security features like alarm systems and access control. This project investigates the use of Micro-Electro-Mechanical Systems (MEMS) technology in the creation of a home automation system. It is intended to improve.

KEYWORDS: MEMS Technology; Arduino IDE

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CONVERSION OF SIGN LANGUAGE INTO SPEECH AND TEXT USING FLEX SENSORS

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ABSTRACT

The deaf and hard of hearing community can communicate more effectively thanks to this creative technology that uses wearable gloves with flex sensors to transform sign language into text and speech. Wearable gloves with flex sensors are used in the system to record sign language gestures, which are subsequently converted into speech and text using an algorithm. Wireless data transfer is made possible via a Bluetooth modulator, guaranteeing dependable and effective connectivity. Real-time, accurate translation that significantly improves the deaf community's accessibility, inclusion, and independence is the system's anticipated result. Equal access to opportunities and information could be made possible by this technology, increasing awareness and reducing the divide between the deaf community and others. The concept is applicable in a number of contexts, such as public areas, offices.

KEYWORDS: Sign language, Sensors, Communication, Bluetooth modulator, Gloves.

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ADVANCED VEHICLE OBSTACLE DETECTION AND ACCIDENT PREVENTION SYSTEM USING RADAR

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ABSTRACT

By integrating radar-based technology, the paper "Obstacle Detection and Accident Avoiding System Using Radar for Advanced Vehicles" suggests a state-of-the-art method to improve vehicle safety. There is a greater demand for strong and dependable accident prevention systems as the automotive industry moves toward autonomous and semi-autonomous systems. This technology uses radar sensors to identify impediments in real time, such other cars, people, or stationary objects, in the route of the vehicle. The system can anticipate possible collisions by processing the radar signals to determine the barriers' distance, speed, and relative movement. To prevent collisions or lessen impact, the system responds by turning on safety features like automated braking or steering adjustments.

KEYWORDS: Obstacle Detection; Radar; Autonomous; Arduino IDE

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GPS AND GMS-ENABLED SMART WEARABLE GADGET FOR WOMEN'S SAFETY BASED ON A RASPBERRY PI

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ABSTRACT

The smart wearable gadget for women's safety that uses GPS and GMS technologies is based on a Raspberry Pi. One of the main benefits of this system is its real-time functionality, which monitoring attempts to avoid. Constant tracking made possible by GPS technology helps authorities find the victim more quickly. The constraints of conventional alarm systems that rely only on internet access are overcome by the integration of GSM, which guarantees that alerts may be broadcast across great distances. Additional technologies like speech recognition, biometric identification, and Internet of Things (IoT) connectivity can be added to this system to increase its efficacy. A tiny camera or audio recording module may also be included in certain system versions in order to gather usable evidence.

KEYWORDS: Women Safety, GPS, Call, GSM, Alarm, Security, IOT.

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INNOVATIVE IOT-POWERED INTELLIGENT SECURITY ENCLOSURE SYSTEM FOR MONITORING AND SAFETY IN AGRICULTURE

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ABSTRACT

The IoT-Based Intelligent Security Enclosure System for Agriculture Safety and Monitoring seeks to solve the problems farmers encounter as a result of poor crop management and conflicts between people and wildlife, as well as to prevent crop destruction. In India, more than half of the population is employed in agriculture. There have been many obstacles to the agriculture sector's expansion. Poor crop management and crop devastation from outside influences, especially confrontations with wildlife, are major issues for farmers. Capacitive touch-sensitive and object-detection sensors in this security system notify us via email when they detect unwanted movement or contact. It coordinates communication with the invader and has a 360-degree rotatable camera with real-time stir discovery.

KEYWORDS: Crop Destruction, Human-Wildlife, Conflict, Agriculture, Security, ray-based Security.

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SWARM ROBOTICS

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ABSTRACT

Swarm robotics' primary goal is to accomplish a task by assembling a number of robots or gadgets into a single group. Swarm robotics is a novel method for coordinating large, primarily simple physical robots in multi-robot systems. The project's goal is to build a swarm of line-following robots in which each robot uses radio frequency (RF) communication to teach the others the course. These robots work together to accomplish a task. These robots can communicate wirelessly, and they move in accordance with such communication. Although there are two robots in this project one is a master and the other is a slave they can communicate with one another wirelessly.

KEYWORDS: Swarm Robotics, Multi-robot Systems, RF Communication, Line-following robots, Coordination

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ELECTRIC VEHICLES WITHOUT RANGE ANXIETY USING V2V CHARGING

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ABSTRACT

The extensive use of electric cars (EVs) has made their integration with the grid a significant topic. Concern has been raised about the potential rise in demand brought on by EVs. With the use of charging models including vehicle-to-grid (V2G), vehicle-to-home (V2H), and vehicle-to-vehicle (V2V) energy transfer, current research has demonstrated that EVs may be advantageous in terms of grid flexibility and reliability. A major obstacle to the widespread use of electric cars (EVs) is "range anxiety," or the concern that the battery may run out of power before arriving at their destination. By including Vehicle-to-Vehicle (V2V) charging as a key element of the EV ecosystem, this initiative offers a creative way to reduce range anxiety.

KEYWORDS: Embedded System; Electromagnetic Induction; Arduino IDE

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DEBLOCKING THE IMAGE BASED ON CONVOLUTIONAL NEURAL NETWORKS

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ABSTRACT

The problem of identifying deblocking processes in Motion JPEG (MJPEG) videos—which are often utilized in broadcasting, storage, and surveillance systems is the focus of this research. Because each video frame is compressed separately, MJPEG's compression technique makes tampering easier even while it enables efficient storage. Traditional detection techniques have a major challenge when deblocking operations are used to smooth compression artifacts, which cause tampered content to blend in perfectly with the video. A supervised Convolutional Neural Network (CNN) is used in the suggested solution's deep learning-based methodology to detect minute deblocking artifacts. A robust and dependable method for video forensics, CNN can learn both low-level and high-level characteristics that suggest deblocking changes by training the model on a large-scale dataset with meticulously labelled patches.

KEYWORDS: Motion JPEG, Video Forensics, Deblocking operations, Deep learning, Convolutional neural network, Video manipulation detection

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DESIGN OF HYPER-EFFICIENT 16-BIT RISC PROCESSOR USING VEDIC MATHEMATICS

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ABSTRACT

The design and functional overview of a 16-bit RISC processor with Vedic Mathematics incorporated are presented in this work. The main goal is to use the Urdhva Tiryakbhyam Sutra to increase the efficiency of multiplication. The CPU has a five-stage pipeline and a reduced instruction set, both of which are features of a standard RISC architecture. The implementation of Vedic algorithms, specifically for the multiplier, improves the processor's speed and area efficiency, which makes it appropriate for low-power and embedded applications. This method also delivers lower latency, better hardware resource utilization, and enhanced performance in arithmetic-intensive operations. The design approach demonstrates the potential of Vedic methodologies in advancing processor design by incorporating old mathematical principles into contemporary digital architecture.

KEYWORDS: Reduced Instruction Set Computer; Von Neumann architecture; Verilog HDl, Vedic Mathematics, Urdhva-Tiryagbhyam Sutra.

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IOT-BASED HUMAN FALL DETECTION SYSTEM

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ABSTRACT

Human body falls are the leading cause of injuries, fatalities, and hospitalizations among the elderly globally. Therefore, fall detection is crucial to senior folks' health care. Current approaches are not accurate or comfortable. This study presents the design of a body fall detection system for senior citizens. Wearable monitoring devices with GPS and mems sensors are part of the hardware interface, which is connected wirelessly to the caregiver via a software interface (mobile application). The elder's location can also be tracked by the global positioning system (GPS), and the GSM module will send calls and SMS to the registered mobile number. An efficient fall detection algorithm is created and applied to precisely detect falls.

KEYWORDS: Detection; Sending; Updating; Insert

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DETECTION OF BORDER SECURITY INTRUSION USING IOT

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ABSTRACT

Intruders are very likely to breach borders. The soldiers find it challenging to continuously and diligently patrol the border regions. Therefore, developing a method that will lessen a soldier's effort is crucial. Soldiers' lives are valuable and fleeting, and they ought to be treated as such. The goal of this suggested approach is to lessen the military's workload. The passive infrared (PIR) sensor, cameras that detect an intruder's motion and alert the control station, and a buzzer that self-activates to alert the intruder that they are in a restricted area make up the suggested portable model. The Internet of Things (IOT) connects all of the sensor networks at the border site.

KEYWORDS: Intrusion Detection, Border Security, PIR Sensor, IOT, Embedded Systems.

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SMART ID FOR PERSONAL SAFETY

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ABSTRACT

The project focuses on creating a personal safety device designed to send emergency alerts to designated contacts with the press of a button. This device utilizes a Node MCU development board, a push button switch, and an HTTP client library for communication with a specific API endpoint. When the push button is activated, the Node MCU transmits an HTTP request to the API, which subsequently initiates the sending of notifications to the selected emergency contacts. These notifications can be delivered as SMS, emails, or push notifications, depending on the features offered by the API endpoint. To ensure security and reliability, the API endpoint must be both authenticated and encrypted. This personal safety device is particularly beneficial in scenarios where pepper spray might be necessary and immediate assistance is needed. Additionally, it can be utilized in various emergency situations, including medical crises or accidents, where timely alerts to emergency contacts are crucial. In summary, this project illustrates the effective application of the Node MCU development board and HTTP client library to create a straightforward yet impactful personal safety device.

KEYWORDS: Pushbutton, Node MCU board, Emergency Contacts DataBase, Wifi, Notification Service

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AGRO GURAD: INTELLIGENT ROBOT FOR SOIL AND CROP MANAGEMENT SYSTEM

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ABSTRACT

This document outlines the design, development, and functionality of AgroGuard, an innovative breakthrough in agricultural technology. AgroGuard enhances plant growth and maintains soil health through a combination of sensor-based analytics and machine learning techniques. This cutting-edge robot utilizes various sensors, including those that measure soil moisture and NPK (Nitrogen, Phosphorus, Potassium) levels, to conduct detailed assessments of soil fertility and customize fertilizer applications for optimal plant health and growth. By harnessing sophisticated machine learning algorithms, AgroGuard determines the most appropriate fertilizers and analyzes weather patterns to suggest the best crops suited for particular climates. The system integrates real-time weather monitoring to anticipate and reduce the risks associated with natural disasters like droughts and floods, thereby providing preemptive strategies to protect crops. The ESP32 controller manages the robot's mechanisms for dispensing seeds and fertilizers, ensuring accurate and effective application. AgroGuard's holistic strategy addresses both short-term and long-term challenges in agriculture, promising increased crop yields, a decrease in plant diseases, and efficient disaster management. This research emphasizes the transformative potential of AI-driven robotics in modernizing farming practices through state-of-the-art technology.

KEYWORDS: Precision Agriculture, AI in Farming, Crop Monitoring, Soil Analysis, IoT, Smart Farming, Agricultural Robotics

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SAFE ELECTRONIC LOCKER

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ABSTRACT

Security and access management are vital components of contemporary storage solutions. This paper introduces a secure electronic locker system that utilizes RFID technology, keypad authentication, and one-time password (OTP) verification. By integrating various authentication methods, the system significantly boosts security, allowing only authorized individuals to access the locker. The setup features a microcontroller-driven design that incorporates an RFID reader, a numeric keypad, an OTP module through GSM, and a solenoid lock to regulate access. This layered authentication strategy fortifies security measures, thereby minimizing the chances of unauthorized entry. Moreover, the system prioritizes user experience, ensuring that the authentication process is both quick and efficient without compromising stringent security protocols. Additionally, the system includes an alert feature that notifies users of unsuccessful authentication attempts, providing an extra layer of safety. This proposed solution is well-suited for use in banks, offices, and personal storage environments, delivering improved security, operational efficiency, and user-friendly convenience.

KEYWORDS: Electronic locker, RFID authentication, OTP verification, keypad security, solenoid lock

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IOT ENABLED PARKING SOLUTION FOR SREAL TIME SLOT IDENTIFICATION

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ABSTRACT

Cities around the globe are increasingly struggling to manage parking spaces due to rising car ownership and inadequate infrastructure. These challenges lead to traffic congestion and extended periods of searching for parking, causing significant frustration for drivers. To address this issue, this project introduces a Comprehensive IoT-Driven Intelligent Parking Solution that combines real-time parking slot detection, cloud connectivity, and a mobile and web-based monitoring and reservation system. By employing ultrasonic and infrared (IR) sensors, the system identifies and communicates the occupancy status of parking spaces, which is then shared with users through an intuitive web and mobile application. This allows users to track parking availability in real-time, make reservations, and receive confirmations. Additionally, LED indicators at each parking slot help drivers by showing green for available spaces and red for those that are reserved. This innovative solution greatly decreases the time drivers spend looking for parking, thereby reducing traffic congestion and enhancing the efficient use of urban parking resources.

KEYWORDS: Arduino IDE, IOT Communication Protocols, MIT App Inventor, IR Sensor,ESPWRoom 32Controller

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LOW POWER HIGH SPEED DADDA MULTIPLIERS

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ABSTRACT

Approximate computing is increasingly utilized to create energy-efficient designs in Very Large-Scale Integration (VLSI). This strategy is especially effective for signal processing and multimedia applications, where minimizing power usage is crucial. By embracing approximate computing, it is possible to achieve quicker and more significant outcomes, albeit with some compromise on accuracy. In this project, a new design methodology is introduced that focuses on monolithic 4:2 compressors. This innovative approach reduces the number of stages needed for partial product multiplication. The performance of the proposed monolithic compressor outperforms that of other 4:2 compressors. The design incorporates majority-logic techniques alongside Dadda multiplication, introducing a unique format for partial product reduction that effectively minimizes maximum output delay. Additionally, this method decreases the use of MOSFETs when compared to other multiplier types, such as Wallace Tree Multipliers. Simulation outcomes confirm that the Dadda multiplier based on approximate computing achieves significant reductions in area use, dynamic power consumption, and processing time relative to traditional designs. This methodology underscores the effectiveness of majority-logic-based designs for VLSI applications, particularly in contexts where slight accuracy trade-offs are permissible.

KEYWORDS: Approximate Computing, Dadda Multiplier, Majority Logic 4:2 Compressor

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LUNG RESPIRATORY RATE ESTIMATION BASED ON SPECTRO-TEMPORAL CNN ANALYSIS

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ABSTRACT

Respiration rate (RR) is a vital physiological measure for the early identification of ailments such as pneumonia, lung cancer, asthma, and cardiovascular diseases. Despite its importance, continuous monitoring of RR is largely confined to hospital settings due to the size, expense, and complexity associated with traditional monitoring devices. This research introduces an innovative algorithm for estimating RR through photoplethysmography (PPG) signals, tackling issues like motion artifacts and signal distortions that occur during routine activities. The proposed method features signal segmentation, preprocessing, and a superlet transform to improve spectral resolution, enabling the separation of actual RR signals from background noise. Experimental assessments reveal impressive accuracy, with a mean absolute error (MAE) of 0.67 BPM and a root mean square error (RMSE) of 1.56 BPM. These findings underscore the feasibility of incorporating this technique into small, wearable devices, which could facilitate real-time RR monitoring in both home and clinical settings. This innovation not only aids in the early detection of diseases and personalized healthcare but also enhances the capabilities of remote patient monitoring, ultimately leading to better patient outcomes and alleviating pressure on healthcare systems.

KEYWORDS: Remote Patient Monitoring, Spectral Resolution, Early Disease Detection, Healthcare

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SMART WASTE DISPOSAL ROBOT WITH CLOUD CONNECTIVITY AND ADVANCED DETECTION

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ABSTRACT

This document outlines an innovative solution aimed at transforming waste management through automation and smart design. Utilizing Wi-Fi connectivity, the robot integrates effortlessly with cloud technology, allowing for remote oversight and operation. Essential elements such as GPS provide accurate location tracking, while ultrasonic sensors facilitate immediate obstacle detection, ensuring fluid movement across various settings. The waste management system features servo and gear motors that are effectively controlled by a microcontroller, enabling the robot to execute intricate tasks with accuracy. Safety and operational efficiency are fundamental to this design. An automatic shutdown mechanism activates in the absence of water, safeguarding the system and preserving resources. Additionally, a gas sensor continuously monitors methane levels, mitigating potential safety risks. Infrared (IR) sensors evaluate waste levels, enabling prompt actions and effective waste management. The user-centric design connects with a local web server, allowing users to oversee and manage the robot from a distance. This flexibility makes the robot appropriate for a range of applications, from urban areas to industrial waste management facilities.

KEYWORDS: GPS, Ultrasonic sensors, Servo and gear motors, and Microcontroller

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UNIVERSAL ROBOT FOR INDOOR FIRE SUPPRESSION

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ABSTRACT

This paper introduces an innovative autonomous system designed for indoor fire suppression, which combines cutting-edge sensing technology, real-time monitoring, and robust control mechanisms to improve fire safety. The system is equipped with multi-zone flame sensors that continuously survey the surroundings and relay directional information to an ESP32-based controller. When a fire is detected, the robot independently moves toward the danger using a path-following algorithm managed by DC motors and an L298N motor driver. Upon reaching the fire source, a servo-controlled water pump is activated to effectively extinguish the flames. Additionally, the incorporation of an ESP32-CAM module allows for live video streaming, facilitating remote monitoring, while a GSM module sends immediate SMS notifications to ensure a swift response. By integrating autonomous navigation, wireless communication, and precise fire suppression capabilities, this research presents a scalable and cost-efficient strategy for updating indoor firefighting techniques, significantly enhancing response times and reducing potential fire risks.

KEYWORDS: Flame Detection, ESP32, Wireless Communication, and GSM Alerts

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ESP32 BASED SMART SIDE COLLISION PREVENTION

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ABSTRACT

The Vehicle Detection System designed for bike helmets signifies a noteworthy progression in technology aimed at enhancing rider safety. This system integrates ultrasonic sensors, ESP32 microcontrollers, and wireless communication to establish a dependable hazard alert mechanism. Utilizing HC-SR04 ultrasonic sensors affixed to the bike, it identifies oncoming vehicles and relays real-time information to the helmet unit through the ESP-NOW protocol. To ensure that riders are promptly alerted in various environments, the system employs multi-sensory notifications via LED lights and a 1.2V vibrating motor. Its efficient low-power design and battery operation support prolonged usage, while the modular setup allows for future improvements, such as the incorporation of AI for vehicle classification. The use of wireless communication helps to avoid latency problems, and its compact design promotes seamless integration with standard helmets. The system has been tested in a variety of conditions, including low visibility scenarios and heavy traffic, proving its consistent functionality and reliability. By enhancing situational awareness and decreasing reaction times, this technology plays a crucial role in improving cyclist safety on busy streets. Additionally, its scalability and flexibility make it ideal for both individual and commercial use, presenting a cost-effective method for accident prevention. This innovation represents a significant advancement in intelligent transportation systems and proactive safety measures for vulnerable road users.

KEYWORDS: Bike helmet safety, ultrasonic sensors, ESP32 microcontroller, wireless alert system, vehicle detection, and rider awareness

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DETECTION OF RETINAL DISEASES BASED ON DEEP CNN

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ABSTRACT

A specialized deep neural network architecture has been designed for the multi-class diagnosis of retinal diseases. Conditions such as diabetic retinopathy, glaucoma, and age-related macular degeneration rank among the foremost contributors to vision impairment worldwide. Timely and precise diagnosis of these ailments is essential for effective treatment and the prevention of vision loss. EyeDeep-Net employs a convolutional neural network (CNN) architecture that is specifically optimized to capture the complex features present in retinal images, thereby improving diagnostic accuracy. The model is trained on a varied dataset of retinal fundus images, which have been annotated by ophthalmology specialists, enabling it to categorize images into several disease classifications. It integrates sophisticated feature extraction methods with hierarchical classification strategies to differentiate between the various retinal diseases. To tackle challenges associated with limited labeled data, EyeDeep-Net utilizes transfer learning and data augmentation, which enhances its robustness and reliability in clinical applications. Extensive evaluations have shown that EyeDeep-Net achieves notable accuracy, sensitivity, and specificity in recognizing and distinguishing between different retinal conditions. It surpasses conventional machine learning methods and serves as a dependable resource for ophthalmologists, potentially acting as a decision-support tool for early diagnosis. In summary, EyeDeep-Net signifies a significant advancement in the application of artificial intelligence for automated retinal disease screening, with the potential to enhance diagnostic efficiency and improve outcomes in the field of ophthalmology.

KEYWORDS: Deep Neural Network, Multi-Class Diagnosis, Retinal Diseases, Diabetic Retinopathy

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EFFICIENT HIGH SPEED MULTIPLIER BASED ON HAN-CARLSON ADDER

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ABSTRACT

Electronic devices are essential in compact environments to ensure rapid performance and minimal power usage. The speed of electronic operations is primarily influenced by arithmetic calculations. In numerous applications related to VLSI signal processing, multiplication is a critical arithmetic function. Therefore, a high-speed multiplier is fundamental for developing any signal processing module. Given that individuals have varied requirements and objectives, various multipliers have been created to meet specific application needs. This paper introduces a Hybrid multiplier that is designed using a combination of Brent Kung and Kogge Stone adders, resulting in a reduced delay of 4.062 nanoseconds compared to existing multipliers.

KEYWORDS: FPGA implementation, Hybrid multiplier, Hybrid adder, High speed, Carry Select adder, Kogge Stone adder, Brent Kung adder.

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CLASSIFICATION AND IDENTIFICATION OF LUNG DISEASE USING MACHINE LEARNING

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ABSTRACT

Support for physicians in identifying diseases is invaluable, particularly in settings with limited resources and staff. Historically, many patients could have benefited from early disease detection. To aid doctors, it is crucial to establish a flexible system capable of accurately and promptly identifying various lung diseases. This project aims to create an automated system for classifying lung diseases, with a particular emphasis on Viral Pneumonia and Lung Opacity, utilizing machine learning methods. Timely and precise detection of these conditions is vital for successful treatment; however, analyzing chest X-rays manually can be labor-intensive and susceptible to errors. This initiative employs the Image Processing Toolbox and Deep Learning Toolbox to develop an efficient method for recognizing lung diseases from medical imaging data. The system comprises four key phases: image preprocessing, feature extraction, model training, and classification. In the preprocessing stage, tasks such as resizing, normalization, and data augmentation are performed to improve data quality. The effectiveness of the model is assessed through metrics like accuracy, precision, and recall. This strategy offers a dependable and efficient solution to support healthcare providers in the early detection of diseases and to facilitate informed clinical decisions.

KEYWORDS: MATLAB software, Image Processing Toolbox, Machine Learning Toolbox, Medical Image Dataset.

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INTELLIGENT SURFACE VEHICLEFOR WATER QUALITY ASSESSMENT

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ABSTRACT

The Smart Autonomous Surface Vehicle for Water Quality Analysis is designed to evaluate water quality using a surface vehicle. Water pollution refers to the contamination of water bodies by harmful substances, rendering the water unsafe for drinking, cooking, cleaning, swimming, and other activities. Common pollutants include chemicals, waste, bacteria, and parasites. Traditional monitoring approaches typically involve manually collecting water samples from different sources, followed by laboratory testing and analysis. This method is often inefficient, as it is time-consuming and does not yield real-time results. Continuous monitoring of water quality is essential to ensure a safe water supply for users from various water bodies. There is a growing need for a cost-effective system that allows for real-time water quality monitoring utilizing the Internet of Things. In this context, a water vehicle is utilized to house the water quality monitoring system. This vehicle is equipped to independently measure water quality. By incorporating IoT devices and a Wi-Fi module, the proposed system facilitates continuous monitoring of water quality. The Wi-Fi module provides internet connectivity and transmits sensor data to the Cloud. Various sensors, including those for turbidity, temperature, and gas, are employed to assess different factors that affect water quality in these resources.

KEYWORDS: EmbeddedC, Arduino IDE, Node MCU, Water Quality monitoring

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STRESS DETECTION WITH HEART RATE VARIABLITY

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ABSTRACT

Stress has become a significant issue impacting both mental and physical health globally. As the demand for non-invasive and precise stress monitoring solutions grows, heart rate variability (HRV) has surfaced as a dependable biomarker. This project introduces a real-time system for detecting stress by utilizing HRV features obtained from ECG signals. We combine signal processing with machine learning methods, including CNN, SVM, and Random Forest, to categorize stress levels. Our deep learning model demonstrated an impressive accuracy of 99.9%, underscoring the importance of feature optimization and the careful selection of algorithms in the classification of stress.

KEYWORDS: Stress detection, HRV, ECG, CNN, Machine Learning, Wearable Devices, Python, Real-Time Monitoring.

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VERILOG AND PYTHON INTEGRATION BASED SMART TRAFFIC SYSTEM

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ABSTRACT

The primary goal of this project is to develop an intelligent traffic control system. Urban areas globally grapple with traffic congestion, which results in considerable delays and inefficiencies in transportation. This paper outlines the design of a Real-Time Traffic Control System utilizing Verilog. The objective is to establish a smart traffic management system that combines Finite State Machine (FSM) principles with a Python-based graphical user interface (GUI) for real-time responsiveness. The core traffic signal logic is executed in Verilog, while Python handles the interfacing and visualization aspects. The Python GUI allows for user-friendly management, offering functionalities such as inputting traffic conditions, like vehicle density in the East and West directions, signaling ambulance arrivals for prioritization, and overseeing pedestrian crossings. By applying a finite state machine (FSM) framework, the traffic light controller effectively manages the sequence of red, yellow, and green lights, ensuring smooth transitions. This innovative method effectively merges hardware simulation with interactive software visualization, positioning it as a strong solution for contemporary smart traffic systems.

KEYWORDS: Smart Traffic System, Verilog, Tkinter, Traffic Management, GUI

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A QUESTION AND ANSWER BASED BOT FOR MODULE LEARNING

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ABSTRACT

Students frequently struggle to quickly obtain relevant answers to their academic questions, which can hinder their learning process. A chat-bot system designed to deliver accurate responses through both text and voice interactions can significantly improve the student experience. This project aims to create a chat-bot that enables students to ask questions and receive answers from a well-organized database of frequently asked questions (FAQs) compiled by teachers. The system features a homepage showcasing the college brochure, an administrative panel for managing FAQs, and a user authentication module for student registration and login. Administrators have the ability to add, edit, and monitor FAQs, while students can interact with the chat-bot using either text input or voice recordings. The chat-bot analyzes the queries and retrieves the most relevant answers from the database. The development process involves several crucial steps: setting up the database, deploying the server, managing user authentication, overseeing the admin panel, and facilitating chat-bot interactions. By combining voice recognition with a structured database, this chat-bot system improves access to information and boosts student engagement. Future advancements may involve AI-driven response generation, multimedia-enhanced answers, and an expanded response limit to further enhance learning efficiency.

KEYWORDS: Chat-bot System, Voice-Based Query processing, FAQ's Database, AI-Powered Response Generation

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ERGONOMIC DESIGN AND FABRICATION OF ALL TERRAIN VEHICLE SUITABLE FOR ALL CLIMATIC CONDITIONS BASED ON CUSTOMER CENTRIC STRATEGY

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Abstract

This study examines the ergonomic design and fabrication of an all-terrain vehicle (ATV) aimed at enhancing user comfort, safety, and performance across various climatic conditions. It combines human-factor engineering with advanced material selection to ensure durability and adaptability in rugged environments. ATV are used for off-road in other country. ATV also known as (All-Terrain-Vehicle). Other name are also known as (LUV) Light utility vehicle. ATV was designed in 1967.ATV as travel in low pressure tyres, seat, and handlebars are used. It's is street legal in another countries. ATV are manufacture because of less amount to spend. It's also used for farming, grocery, transport in other countries ATV suitable for diverse terrains and climates, delivering superior performance and user satisfaction.

KEYWORDS: 125cc Engine, Chassis, Rear axle, low cost, Customer satisfaction.

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DESIGN AND DEVELOPMENT TWO-WHEELER THAT GUIDES THE DRIVER FOR OPTIMAL USE

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Abstract

This project presents the design and development of a two-wheeler that guides the driver for optimal use, integrating smart features to enhance safety, efficiency, and convenience. The system incorporates speed monitoring, voice interaction, and health tracking, using IoT integration with the Electric Control Unit (ECU) for an improved riding experience. Speed monitoring alerts the rider upon exceeding set limits, preventing accidents, while voice interaction enables hands-free control. Health tracking features such as heart rate and fatigue detection provide alerts in case of potential health concerns. A key component is the predictive guidance system for traffic and weather, helping riders plan routes optimally, reduce fuel usage, and save time. GPS-based navigation aids in accurate route guidance, avoiding congestion and risky paths. IoT connectivity facilitates smooth communication between the dashboard and ECU for real-time data processing. The system is built with an intuitive interface, ensuring ease of use for diverse riders. This smart two-wheeler design represents a major advancement toward intelligent mobility solutions, improving road safety while optimizing rider performance and experience.

KEYWORDS: Smart Dashboard, IoT Integration, AI Voice Assistance, Real-Time Navigation, Health Monitoring, Two-Wheeler Safety.

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DESIGN AND FABRICATION OF PORTABLE SOLAR POWER UNIT

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Abstract

The increasing global dependence on fossil fuels for electricity generation continues to pose serious environmental challenges, including climate change and global warming. Additionally, frequent power outages especially during natural disasters like cyclones highlight the urgent need for uninterrupted electricity supply. With the growing reliance on remote work, digital education, and virtual communication, traditional solar systems often fall short due to their bulky design and lack of mobility. This work focuses on the design and fabrication of a portable solar power unit aimed at addressing these issues by offering a reliable, clean, and mobile energy solution. The system integrates mono crystalline photovoltaic (PV) panels for efficient solar energy capture, a charge controller for regulated energy flow, a lithium-ion battery for compact energy storage, and an inverter to support various AC and DC loads. The unit is capable of powering essential electronic devices such as laptops, mobile phones, and Wi-Fi modems, making it ideal for emergency scenarios and off-grid applications. The lightweight, compact, and easy-to-deploy design ensures user convenience and flexibility, particularly in remote or disaster-affected areas. Experimental testing confirms the unit's ability to deliver stable and sufficient energy output, proving its suitability as a sustainable alternative to conventional power systems. This work provides an accessible and eco-friendly power solution that meets the growing demand for portable and renewable energy sources.

KEYWORDS: Solar Panel, Solar Charge Controller, Rechargeable Battery, Base 800 Inverter

ISBN Number: 978-93-48505-82-8

DESIGN AND DEVELOPMENT TWO WHEELER THAT GUIDES THE DRIVER FOR OPTIMAL USE

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Abstract

This project focuses on developing an advanced smart dashboard system for two-wheelers, integrating real-time monitoring and direction control to enhance safety, efficiency, and rider convenience. The system features speed detection, voice modulation, and health monitoring, leveraging IoT integration with the Electric Control Unit (ECU) for a seamless riding experience. Speed monitoring helps prevent accidents by alerting riders when they exceed set speed limits, while voice modulation enables hands-free operation. Additionally, health monitoring functions, such as heart rate and fatigue detection, provide safety alerts in case of potential health risks. A key highlight of this system is its predictive analytics for traffic and weather conditions, enabling riders to plan routes more efficiently, minimize travel time, and reduce fuel consumption. GPS-based navigation ensures accurate direction control, helping riders avoid congestion and hazardous routes. The IoT-based connectivity allows smooth communication between the dashboard and the ECU for efficient data processing. Designed with a user-friendly interface, this smart dashboard makes technology accessible to a wide range of users, marking a significant step toward intelligent transportation that improves road safety and enhances the riding experience.

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LifeLink: Enhancing Emergency Response and Resource Management

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ABSTRACT

LifeLink is a crisis management platform that facilitates the emergency response through interconnectivity between users, volunteers, NGOs, and administrators. The system itself has well-defined roles and responsibilities and respective functionalities that guide its personnel on reporting, tracking, and resolving emergencies. Users can complain by sending SOS messages in text or video format. The complaints thereafter are monitored by volunteers and NGOs. Volunteers thus play an important role in dealing with complaints by assigning the status and dispensing resources when necessary. NGOs supervise the volunteers and also ensure efficient resource allocation for dealing with emergencies. The administrators, having a robust dashboard, oversee the day-today activities of the platform. Then, on the dashboard, they will be able to add different NGOs, volunteers, and emergency datasets, monitor SOS messages, and complaints mapped on an interest with location tracking. Additionally, there are safe hubs that provide safe zones for those in need. With a structured yet collaborative approach, Crisis guarantees an efficient emergency response as well as proper resource management and crisis mitigation.

KEYWORDS: Crisis management; Emergency response; Volunteer coordination; NGOs resource allocation; SOS reporting.

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TRAFFIC-CAST: AI-DRIVEN TRAFFIC FORECASTING SYSTEM

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ABSTRACT

This is how the TRAFFIC-CAST tackles the burning issue with the absence of predictability of traffic patterns in urban environments: an innovative dual module solution of real time vehicle tracking paired with predictive analytics of traffic. Since vehicle detection and classification as well as multi-object tracking are key requirements to generate comprehensive vehicle movement data, we apply YOLOv8 for the vehicle detection and classification and ByteTrack for the multi-object tracking. That data goes into a custom trained Prophet forecasting model that takes care of complex seasonality patterns to predict the future traffic conditions. High detection accuracy across different vehicle classes and weather conditions are shown by the experimental results and strong prediction performance is achieved for short term forecasts and satisfactory results for long term forecasts. Structured reports highlight potential congestion periods which can be utilized for actionable insights for traffic management authorities, urban planners and transportation companies. We demonstrate how to implement our solution with implementation and system architecture methodology, and performance metrics.

KEYWORDS: Traffic Prediction, YOLOv8, ByteTrack, Prophet Model, Computer Vision, Time Series Forecasting

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SMART GEO ATTENDANCE APP

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ABSTRACT

Manually tracking employee attendance across different office locations is often very time consuming and inaccurate. In an attempt to ease this process attendance tracking, grievance handling, and check- ins have been automated through an Android application that leverages geolocation technologies. An employee's attendance can now be marked while going in or out of the office for on-site employees, while remote workers can also clock in from their current location. The system supports different roles with the Admins being able to create or edit user files, assign roles, check in and process salaries, and monitor grievances. HR personnel checks for live attendance, manages user complaints, operates the intern, while ordinary users can see their attendance, assigned chores, salary information, and register a complaint. As the application eliminates manual interference and inaccuracies record- keeping is accurate, mistakes are reduced, and the level of transparency improves. This enables the application to enhance workforce productivity and streamline operations that are directly related to employee management for organizations.

KEYWORDS: Android, Employee Management System, Attendance Tracking, Complaint resolution, Duty Assignment, Salary Management, HR System, Organizational Efficiency

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A Unified Management System for Elders and Orphans - A Hope Hub

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ABSTRACT

The Elder and Orphanage Management System is a simple yet effective application that could help govern orphanages and old-age homes. It has three significant roles for the users, Admin, Staff, and Volunteers/Donors; each has its functions in making smooth operations. Admin is to manage Staff and Resident details and view volunteers and events. The Staff Updates Resident details and Event details, manages gallery and requests donations. The Volunteer/Donor sends feedback, view gallery, and make donation. Updating profile is also available to the users. The web-based application ensures smooth and effective communication, transparency, and coordination-all of which contribute to a well-organized and favorable environment for children and elderly residents.

KEYWORDS: Old-age Homes and Orphanage management, User-friendly UI, Administration, Admin, Staff, Volunteer/Donor, Resident Details, Efficient Communication, Smooth Coordination.

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IMPROVING URBAN TRAFFIC FLOW WITH AN INTELLIGENT PARKING RESERVATION PLATFORM

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ABSTRACT

The Online Parking Place Reservation System is an application accessible through mobile gadgets and the web which aims at simplifying the reservation and locating of parking spaces in congested city centers. This system attempts to alleviate the stress of finding parking by allowing for prior reservations, thus easing traffic flow. The system improves user experience by offering real-time updates on availability, geo-location navigation, as well as a secure payment gateway for further ease of access. The system also has features for managing reservations, monitoring occupancy, and accessing usage statistics to aid parking managers in better managing their space. The system is very useful for modern cities due to its online payment and geo-location capabilities, which makes the system very useful for urban areas. The system has great potential in improving mobility in urban areas, and in turn, significantly ameliorating the impacts associated with the idling of vehicles on the environment. Those living in urban areas are often challenged with the limited availability of parking spaces which results in congestion and time wastage. The Online Parking Reservation System helps address these issues through a mobile and web-based approach that allows users to reserve parking spaces ahead of time. The system employs geo-location technology to navigate users to nearby parking facilities while confirming availability in real time. The system reduces stress associated with reservations and payment through its streamlined processes and secure gateways.

KEYWORDS: Smart Parking Solutions, Advanced Reservation System, Real-Time Availability, Urban Mobility Optimization, Efficient Parking Management, Intuitive User Interface

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ED-TECH INNOVATION FOR CAREER SUCCESS: A PLATFORM TO BRIDGE LEARNING AND INDUSTRY NEEDS

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ABSTRACT

It's straightforward to observe that the opportunities available for graduates in the software engineering field seem to be hindering their potential and aspirations. Given the competitive nature of the market, it has become a struggle to find suitable placements. Applicants often face the problem of obtaining inadequate search results on the available career pages and tools because traditional job portals catalog postings devoid of the applicant's field. They do not take the applicant's technical background into consideration. To address this problem, Narayana Engineering College students and graduates get a tailored job portal through Narayana Career Connect. It is a specialized offering tailored for them. The system contains caring algorithms which provide the user with the best possible jobs by analyzing their programming skills, career's objective and preferences. This practical approach makes sure that aspiring software engineers are able to receive fruitful placements. Besides the employment opportunities, Narayana Career Connect makes available a holistic ecosystem of career support services to allow the graduates to develop modern, successful careers. The platform provides a bunch of application preparation services including coding tasks, skill evaluation, do it yourself CVs sponsored by the platform, professional guidance, and mock screening examinations so that the applicants are trained as per modern corporate standards, which raises their chances of obtaining a job. Very happy employers seize the opportunity to easily filter their ideal candidates who have completed their degrees and are available to be employed in the presented positions. By bridging the divide between students' academic learning and industry expectations, the platform actively enhances employability for the students while streamlining the recruitment process for the employers.

KEYWORDS: Job recommendation, Fresher jobs, Skill-based matching, Career mentorship, Learning resources, Software engineering careers, Graduate job search, Professional development, Networking for freshers, Career growth.

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IMPROVING DIGITAL ACCESSIBILITY: A CONTACT APP FOR THE BLIND USING VOICE COMMANDS

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ABSTRACT

Enhancing the life and independence of individuals with visual impairments requires the improvement of assistive technologies. The Android Contact Application for the Blind fills that gap. Voice commands simplify the activation of various functions. Users can make calls by voicing the contact's name or number, SMS messages can be sent to specific phone numbers, new contacts can be added through voice input, and multilingual support is available, enhancing global accessibility. The application uses speech recognition and text-to-speech, thus removing the need to physically interact with the touchscreen interface.

Through the implementation of this type of assistive technology, the project aims to empower visually impaired users with seamless communication without interfaces requiring physical interaction. Beyond improved accessibility, the application's voice-driven functionality supports the overarching goal of inclusivity. The solution can be improved by integrating additional features later on or adapting it to better assist those with visual impairments.

KEYWORDS: Accessibility, Voice Recognition, Speech-to-Text, Text-to-Speech, Contact Management, Multilingual Support

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EDUCATIONAL MANAGEMENT SYSTEM

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ABSTRACT

CMS stands as a detailed digital program which organizes various institutional administrative processes throughout educational organizations. The system enables communication between three essential user types consisting of administrators together with faculty members and students. The system grants administrators complete control of the features to manage faculty members and students including creation and modification of their records. Administrators handle workshop administration while performing observation duties regarding student enrollment and keeping track of educational results. Users with faculty status access the system via login to see their student enrollment and perform attendance recording while assigning grades as well as accessing workshop information. Students access the system to review available workshops along with their recorded attendance and their academic grades. A security protocol with access control measures grants unique permissions to each user role so users can accomplish their assigned work activities without gaining access to sensitive information.

KEYWORDS: College Management System, Student Information System, Attendance, Fee Management, Examination, Results

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CAMPUS CONNECT: A CENTRALIZED EVENT MANAGEMENT SYSTEM FOR EDUCATIONAL INSTITUTIONS

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ABSTRACT

Campus Connect is an educational institution that provides a digital suite to overcome the inefficiencies of traditional process of managing events in educational institutions. Mainly, event is automated by it to handle registration, participants tracking and certificate generation and at the same event helps to streamlined event organization and improving the administrative efficiency in the process. Secure payment processing, real time reminder and automated certificate issuance are delivered to the platform. The scalability of Campus Connect's architecture allows it to operate in an efficient manner while providing a great pale of experience for event management. It is confirmed that it works to increase accuracy of registration and overall coordination of the event.

KEYWORDS: Educational event management, Automation, Secure payment integration, Real-time notifications, Certificate generation, Operational efficiency, Scalable architecture

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EMPOWERING ARTISANS- A DIGITAL MARKET PLACE FOR HANDICRAFTS AND TEXTILES

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ABSTRACT

A Digital Market place for Handicrafts and Textiles is a robust platform designed to empower and support artisans through an open platform where they can showcase, promote, and sell their handmade products and textiles. The system addresses the artisans' needs such as limited market access, invisibility, and technical challenges by providing a friendly and feature-rich digital marketplace. Developed with React.js as the responsive frontend, Spring Boot as the scalable backend, and MySQL as an effective data handling solution, the website supports three different user roles: Admins, Artisans, and Customers. Admins are tasked with running the platform, managing user accounts, monitoring promotional activity, and awarding badges to artisan products to promote exposure and visibility. Artisans can register, upload, and manage products, create and participate in events, send messages to other artisans, buy premium subscriptions, and track orders. Consumers can browse through a massive range of exclusive hand-made items, add to a cart, and buy securely with a simple checkout process. The website welcomes the community with features like live artisan chat, event creation, and collaboration between artisans. It also encourages the maintenance and spread of cultural crafts in aspects of product promotion and recognition schemes like badges. Addressing some current problems like competition, commissions for platforms, and insufficient technological assistance, Local Artistry is supportive of the artist to network with worldwide communities. Beyond merelyan e-commerce website, the solution emphasizes facilitating the preservation of cultures and economic emancipation. Buyers can enjoy a carefully curated portfolio of genuine handmade products, and makers receive resources and tools with which to sustainably develop. Admin features allow for the platform to operate smoothly and enable artisan growth effectively. Local Artistry closes the gap between artisans and international markets, increasing exposure, simplifying transactions, and promoting sustainable growth through its intuitive interface and depth of features.

KEYWORDS: Digital Marketplace, Artisans, Handicrafts, Textiles, Community Building, Cultural Preservation, E-commerce.

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MYPLATTER – PERSONALIZED FOOD ORDERING & CHEF EMPOWERMENT PLATFORM

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ABSTRACT

MyPlatter, a cutting-edge mobile app based on the Android platform, is meant to link individuals with home cooks, offering an easy interface to access freshly prepared homemade food. The app enables users to register, search for available cooks, and place direct meal orders, for a personalized and easy dining experience. Cooks can effectively maintain their profiles; accept meal requests, and update order statuses, making it easier to home-based food services. Through emphasis on convenience and accessibility to the user, the platform provides a structured and dependable alternative to traditional dining, making home-cooked meals more accessible to users looking for healthier and less expensive food. By creating direct interaction between users and home chefs, My Platter establishes a trusted and community-based network of food. As much as the platform improves food accessibility, facilitates home cooks by giving them a platform to display their cooking talent and increase their number of customers. In contrast to restaurant businesses, the application places greater emphasis on food quality, cleanliness, and personalization, giving users more choice over their meals. With its easy-to-use interface and streamlined order system, MyPlatter reshapes contemporary food-sharing experiences, turning home-cooked meals into a more practical and desirable choice in today's busy lifestyle.

KEYWORDS: Android development, home-cooked meal delivery, mobile food ordering, user experience, community-driven platform, home chef marketplace, meal personalization, food accessibility, digital food services, mobile application.

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ONEGIVE-CENTRALIZED APPLICATION FOR GOODS, MONETARY, BLOOD DONATIONS, AND DOCTOR CONSULTATION

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ABSTRACT

In today's fast-paced world, many people are willing to donate essential items such as food, clothes, medicine, and educational materials but often struggle to find the right platform to do so effectively. At the sametime, numerous orphanages, old-age homes, and charitable organizations require continuous support but face challenges in reaching potential donors. The One Give Donation App bridges this gap by creating a seamless, technology-driven platform that connects donors with those in need. One Give is an Android-based donation management system developed using Kotlin, Java, and SQL designed to make the act of giving more structured and accessible. The app allows donors to contribute various items with just a few clicks while ensuring that the donations are assigned efficiently to suitable recipients. Additionally, the app integrates a blood donation system, enabling users to check blood availability and request donations when required. The roles in the system are Donors who wish to contribute can easily donate items, track their past donations, and even consult registered doctors for health-related advice through an in-app chat feature, Receivers are NGOs, orphanages, and charities that require assistance can receive assigned donations based on their needs, ensuring resources reach the right place at the right time and Admin is Responsible for verifying donation requests, assigning them appropriately, registering NGOs and medical professionals, and overseeing the overall process to maintain transparency and efficiency.

One of the standout features of the One Give Donation App is the Chat with Doctors functionality, where donors and receivers can seek medical advice directly within the platform. Moreover, the bloodbank module plays a crucial role in connecting donors with blood banks and individuals in urgent need, potentially saving lives. By leveraging technology, the OneGive Donation App aspires to foster a culture of giving and social responsibility, making it easier for people to contribute and ensuring that help reaches those who need it most. This project is not just about donations—it's about building a stronger, more connected community through compassion and innovation.

KEYWORDS: Donation, Donor, Admin, NGO, BloodBank, Food, Books, UI/UX, Android Based Donation Management System, Data Security, Monetary Donation.

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INTELLIPROCT: AN AI-DRIVEN ONLINE EXAM MONITORING SYSTEM FOR PREVENTING ACADEMIC DISHONESTY

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ABSTRACT

IntelliProct is an innovative platform utilizing AI technology that is aimed at transforming the landscape of authenticity in remote exams and proctoring. It offers a secure, smooth, and fair exam experience for policy makers, faculty, and students - each with their own unique functions and usecases. Administrators manage and maintain the platform, including the management of administrator, faculty and student user accounts and viewable exam question papers. Faculty create the academic assessment system. They create exam questions that can be typed manually in the exam program or imported automatically into the exam. Faculty schedule the exams and review the exam results, and there is some unique functionality in the IntelliProct platform to let the faculty determine if an exam attempt is real or fake. Students interact with the platform by accessing exam schedules, taking their exams and reviewing their results. The platform includes real-time identity verification capability to ensure the student is who they say they are when they take the exam, to eliminate impersonation orcheating. Students access the platform separately from faculty, and all activities on the platform are recorded within the program to maintain transparency and integrity. IntelliProct provides advanced monitoring capabilities using real-time tracking, verification of identities, and AI-based anomaly detection to flag any suspicious activity that may arise during assessment periods. It offers customized alerts to administrators and faculty in case of an integrity issue, enhancing the trustworthiness of the assessment. IntelliProct automates key exam-related processes but does not require an exam center or proctor in- person. When implemented properly, IntelliProct can streamline assessments for students and faculty in remote learning environments. IntelliProct employs technologies like OpenCV for facial recognition, automated exam scheduling, and AI-based proctoring to provide fair and secure remote examinations. The system promotes confidence in academic processes by removing biases from assessments being monitored, and in turn enables a trustworthy confidence in assessments.

KEYWORDS: Proctoring System, Academic Integrity, Real-time Monitoring, Identity Verification, OpenCV, Automated Exam Scheduling, Remote Learning, Secure Exam Platform

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A REAL TIME CIVIC ISSUE REPORTING SYSTEM

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ABSTRACT

In today's rapid-growing urban life, citizens in the city have to report to local civic bodies for a clean and smooth operation of the city. This portal has a seamless integration with Municipal Corporations/Communities for hassle-free management of the reported issues in several local government departments. Thus, such a vision has SWACHH CITY: An integrated portal made for bridging the gap between the people of Nellore and their civic bodies. The current complaint management process is often inefficient, lacking effective communication between users, volunteers, and administrators. Users are having trouble in reporting incidents during emergencies, whereas volunteers experience difficulty in receiving and resolving complaints. Moreover, administrators require a streamlined process to monitor complaints and confirm volunteers. This application would seek to alleviate these issues through the integration of user-friendly aspects and enhancing coordination between all involved parties. It can register users and report issues with the help of geo-tagged photo uploading for easy communication. The application will automatically generate the description of uploaded images with the help of AI-based image captioning so that there is greater efficiency. Real-time issue tracking will provide users with live updates about their reports, thus generating transparency and credibility in municipal services. This application automates the complaint management system by combining user, volunteer, and admin features. The combination of these components increases communication and effectiveness in dealing with problems, creating a unified atmosphere for volunteers, administrators, and users.

KEYWORDS: User management, complaint submission, generative AI, volunteer verification, admin oversight, progress tracking.

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EDUGLIDE

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ABSTRACT

The Student EduFlow platform is an innovative solution designed to enhance student learning, assessment, and career development. It provides a centralized system for managing academic tasks, offering a seamless experience for both students and educators. The platform includes a dedicated code editor, allowing students to complete lab tasks and coding assignments efficiently, with support for multiple programming languages, real-time error detection, and automated grading. Additionally, students can access a comprehensive repository of study materials, including lecture notes, textbooks, and exam guides, which can be viewed online or downloaded for offline use. To ensure effective assessments, Student EduFlow features an exam panel where educators can create coding and theoretical exams with automated evaluation and feedback mechanisms. The system supports multiple question formats, including MCQs, coding challenges, and subjective questions, with built-in plagiarism detection to ensure fairness. The admin dashboard enables educators to manage student progress, review assignments, and post career opportunities, while the student dashboard provides access to assignments, study materials, and performance analytics. Beyond academics, the platform focuses on career readiness through a dedicated placement and career portal. Students can explore internship and job opportunities based on their academic performance and interests. The platform includes aptitude, verbal, and logical reasoning modules, preparing students for competitive exams and placement processes. Additionally, students can upload their resumes and track job applications, while recruiters can directly post job listings and conduct hiring drives. With continuous advancements in educational technology, Student EduFlow aims to integrate AI-powered personalized learning recommendations, blockchain-based certification management, and virtual coding competitions to further enhance student engagement and employability. By combining academic resources, automated assessments, and career opportunities in a single platform, Student EduFlow ensures a comprehensive learning and career development experience, empowering students to achieve academic excellence and secure promising professional opportunities.

KEYWORDS: Submission Reports, Task Status Tracking, Student Analytics

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SMART PERSONAL FINANACE MANAGEMENT SYSTEM

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ABSTRACT

The Finance Management System is a full-featured web-based application that helps users with managing their finances while improving the tools needed to achieve specific financial goals. The system contains functionality for tracking personal expenses, dramatically enhancing user's ability to manage a budget, calculating the time it will take to achieve financial goals, using an AI chatbot for assistance, and updating graphical views of expenses with pie charts and other visual aids. The Finance Management System is user-friendly and efficient for that purpose. Using the chatbot Assistance within the Finance Management System improves the user's experience of the website by providing personalized financial advice. Another key feature of the Finance Management System includes the ability to provide a user with an estimated time frame for how long it will take to save money towards a financial goal using either backend calculations or interactive frontend interfaces. Users can provide details in terms of the amount of money they want to save as a target amount and how much they are willing to save monthly. In a moments time, the system provides a calculation of how long it would take to save for the financial target amount so the user can make financial plans about the goals they want to achieve. Another productive feature that contributes to the user's experience is the ability to back a pie chart with categories of expense and savings, which allows the user to view the breakdown of their spending. The Finance Management System also provides data on each months savings amount and added comparisons to previous months for tracking progress and making adjustments to budgets in the area that necessitates modification. Having the ability to view an overall pie, the user can evaluate their spending patterns, then in short order, works to optimize spending using financial strategies toward specific goals.

KEYWORDS: Finance management, expense tracking, budget planning, chatbot assistance, goal tracking, visual analytics, personal finance, financial planning

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MEDISYSTEM PRO

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ABSTRACT

MedStore Pro is a comprehensive medical store management system designed to streamline the interactions between various stakeholders in the healthcare and pharmaceutical sectors, including Admins, Merchants, Suppliers, Customers, and Doctors. The system offers a user- friendly platform to manage core functionalities efficiently. Admins can access a centralized dashboard to add or view doctors, manage merchants, suppliers, medicines, patients, and monitor expired medicines. Merchants are empowered to communicate with suppliers, book medicines, handle payments, and request replacements for expired stock. Suppliers play a pivotal role by adding new medicines to the inventory, managing merchant requests, and ensuring timely replacement of expired products. Customers benefit from features such as medicine search, booking, doctor search, and appointment scheduling, with options to view their booked medicines and appointments. Doctors can log in to view and attend appointments, update statuses, and interact with patients effectively. The system also incorporates advanced functionalities like automatic product reordering and voice search to enhance usability and operational efficiency. MedStore Pro optimizes workflows, improves communication, and ensures a seamless experience for all users, contributing to better healthcare outcomes and efficient pharmaceutical operations.

KEYWORDS: Healthcare Management, Pharmaceutical Inventory, Admin Dashboard, Medicine Booking, Appointment Scheduling

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IVILLAGE-AN INTELLIGENT SOLUTION FOR RURAL DEVELOPMENT

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ABSTRACT

iVillage – Intelligent Rural Development Solution is a web-based platform for enhancing village administration, community engagement, and efficient governance. Through the platform, users can raise issues, find information on government schemes, and participate in activities at the community level. APIs are supported in the platform for seamless data sharing among administrators, ward members, and citizens for effective communication. Real-time notification via SMS and mobile notifications informs users of issue resolution, new schemes, and community updates. Role-based access controls security, with multiple stakeholders taking up specific actions. Centralized database usage in the system facilitates effective data management and record- keeping. User-friendly UI and mobile support make iVillage transcend the digital divide, enabling rural communities through technology-based solutions. By its emphasis on transparency, accountability, and citizen participation, it lends support to sustainable rural development.

KEYWORDS: Rural Development, Digital Governance, Smart Villages, Community Engagement, Problem Reporting, Government Schemes, Citizen Participation, Technology for Development

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ANDROID-BASED SMART HEALTHCARE SCHEDULING AND CONSULTATION APPLICATION

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ABSTRACT

HealthTrack is an advanced healthcare app developed to modernize and improve medical services for patients and healthcare providers. HealthTrack is a comprehensive digital environment that provides more efficient healthcare services by providing appointment scheduling, interactive consultations, queue management, and automated billing via an app. This unique tool endeavors to reduce patients wait times and hospital activities while providing better accessibility of medical services. The app harnesses AI-powered recommendations and real-time notifications to create a personalized healthcare experience for the users that helps them manage and schedule their appointments, medication reminders, and consultations with doctors smoothly and seamless. HealthTrack is also centered on the security and privacy of your health information with an encrypted data transmission system for health records stored using the application and compliance with health regulation requirements. Future developments in the application will evolve with HealthTrack connection with electronic health records, AI-enabled diagnostics, predictive analytics, and upgraded telemedicine components to help further the scope of patient care and hospital management. Finally, HealthTrack closes the digital gap of healthcare providers and patients by automating services that rely heavily on human interaction and provides a safe environment for health care delivery. Smart automation, real-time communication, and data-informed decisions will help change the current footprint of digital healthcare with particular emphasis on quality and use of technology to leverage better health outcomes and promote operational efficiency.

KEYWORDS: Scheduling appointments, Queue management, Medical Records, Automated Billing.

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COLLEGE CAMPUS SAFETY AND SUPPORT SYSTEM

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ABSTRACT

This work aims to develop a comprehensive system to ensure the safety and well-being of students across a college campus. It integrates several essential components: student Safety Detection, Help Desk Management, Anti- Ragging Mechanisms, and Real-Time Incident Notifications to Faculty. The student Safety Detection feature enhances campus security through AI-powered surveillance. It continuously monitors CCTV footage to detect any unusual or suspicious activities near students. In case of potential threats or inappropriate behaviour, the system immediately notifies campus authorities and the designated faculty members to ensure prompt intervention. The Help Desk Management component provides an efficient platform for students to communicate with the college administration. Students can log complaints, raise queries, and request assistance related to academic, administrative, or personal matters through a user-friendly interface. This system also includes automated support to help students with common concerns, ensuring a smoother resolution process. The Anti-Ragging Mechanism empowers students to report any incidents of ragging confidentially and securely. The system categorizes cases based on severity, allowing the college's anti-ragging committee to address the most critical issues first. By ensuring anonymity and prompt reporting, the system helps maintain a zero-tolerance environment for ragging. The Real-Time Incident Notifications to Faculty component ensures that faculty members are immediately informed of any unusual activities or altercations, such as fights in classrooms or on campus. This feature allows faculty to respond swiftly to maintain a safe and disciplined learning environment. This integrated solution provides a comprehensive approach to student safety, support, and discipline on campus, fostering a secure and positive educational environment for all.

KEYWORDS: Campus Safety, Student Security, Incident Reporting, Emergency Response, Threat Detection, Violence Prevention, Safety Monitoring, Campus Support.

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ACADEMIC DEPARTMENTAL AUTOMATION – EFFICIENT ABSENCE NOTIFICATION & GRADING SYSTEM

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ABSTRACT

This project presents a comprehensive solution aimed at improving the operational efficiency of educational institutions. The system consists of two main components: the Automated Absence Notification System and the Internal Marks Management System.

The Automated Absence Notification System allows for free flow of information from students to mentors by means of automated reminders every time a student is absent. Each student has a corresponding mentor assigned to them, which allows for effective workload handling and effective absence tracking. Mentors can provide reasons for being absent, thereby ensuring correct attendance records. The Internal Marks Management System automates the calculation of internal marks by shifting mid-term exam marks onto a normalized 20-point scale based on the application of weighted averages. The system also aggregates term work, assignment, and attendance marks to calculate consistent internal grades. The system also generates categorized report cards which put students into least marks, average marks, and good marks categories. Overall, this solution significantly reduces administrative workload, which improves efficiency and accuracy in all educational departments.

KEYWORDS: Absence Notification System, Internal Marks Management, Educational Automation.

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SKILL SYNCPRO: REAL-TIME COLLABRATIVE LEARNING TOOL

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ABSTRACT

Through efficient peer-to-peer communication and resource sharing, SkillSyncPro is a collaborative online platform that aims to transform the exam preparation process. With the help of the system's private and public virtual study rooms, users can instantly share important resources like notes, PDFs, and presentations. With features like voice discussions and real-time chat, SkillSyncPro improves the learning process by enabling users to share knowledge instantly and clear up any questions they may have. The platform enables users to collaboratively create, modify, and share comprehensive study plans in order to guarantee structured and goal-oriented preparation. SkillSyncPro also offers a safe location to store and organize study material drafts, guaranteeing that no important information is lost. By turning solitary study into a group activity, SKillSyncPro creates a positive learning atmosphere where students from different educational.

KEYWORDS: Collaborative Learning, Peer to Peer Interaction, Exam Preparation, Study Platform, Study Room, Real Time Communication.

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STUDENT PROJECT MANAGEMENT SYSTEM

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ABSTRACT

Student Project Tracking System is a web-based application that will improve college academic project management. The application provides a clean and streamlined workflow for collaboration between students, faculty advisor, and administrators. Students can register a project easily, assign team members, submit reports, and monitor progress on an easy-to-use and simple interface, whereas faculty members can monitor project updates, set review dates, and offer remarks. Among the top functionalities of the system is role-based access control to provide only the user such as Admin, In-charge, Guide, Students, and Head of Department for achieving certain privileges depending on his/her role. The system allows transparent, accountable, and timely project monitoring. With that, the system mechanized the submission of documents and final report compilation in order to eradicate administrative tasks and enhance organizational productivity. By not using the traditional manual method of tracing, the system prevents errors and enables the simplification of the whole project management process.

KEYWORDS: Student Project Tracking System, Academic Project Management, Web- Based Application, Role-Based Access Control, Real-Time Project Monitoring, Document Submission, Faculty Collaboration, Workflow Automation, Educational Institution, Digital Project Management.

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ENHANCING STUDENT ENGAGEMENT IN VIRTUAL ENVIRONMENTS WITH IMMERSILEARN

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ABSTRACT

Immersive learning using virtual reality (VR) is transforming education by creating interactive and engaging environments that enhance learning outcomes. By simulating realworld experiences, VR enables learners to actively participate in educational activities, improving knowledge retention, problem-solving skills, and critical thinking. Research indicates that VR-based learning increases motivation and engagement by offering hands-on experiences that traditional methods often lack. Various fields, including medicine, engineering, and science, have successfully integrated VR to provide realistic training scenarios in a safe and controlled setting. Despite its benefits, challenges such as high costs, accessibility barriers, and potential cognitive overload remain concerns. However, continuous advancements in VR technology, along with its integration with artificial intelligence and adaptive learning systems, are expanding its potential in education. As research progresses, VR is expected to play an increasingly significant role in shaping the future of immersive learning, making education more interactive, personalized, and effective

KEYWORDS: Immersive learning, virtual reality, experiential learning, interactive education, simulation-based learning, VR in education.

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HACK CONNECT

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ABSTRACT

There is a huge need for efficient digital tools for participant interaction as well as event planning in order to organize Hackathons today. The present ongoing hack connect is a web-based platform with a database-driven architecture that facilitates the web page development and deployment for the hackathons. This paper presents the development and construction of a portal that is dedicated to hackathon organizations and is user-friendly to participants and organizers in terms of efficiency. The main functionalities include publishing a large amount of detailed information regarding the event facilitating multiple competition modes such as coding sessions and project presentation and submission, and adaptable round configurations to support different event layouts. In addition, the platform features an in-built dynamic problem-solving mechanism for users. The backbone of the platform runs through collaboration tools that enable participants to create and manage teams by themselves through chat and a registration system based on a service-oriented architecture. To ensure fairness and transparency during competition, sufficient rules and regulations are provided. The integrative development process enables the website to focus on participants interaction during the hackathon to build an innovative and empowered community.

KEYWORDS: Team Collaboration, Real-Time Communication, Registration System, Competition Guidelines.

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INTELLIOCR AI-DRIVEN MEDICAL DOCUMENT PROCESSING AND ANALYSIS

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ABSTRACT

Intelli OCR is an AI-powered application designed for medical document analysis, enabling efficient extraction, processing, and interpretation of complex medical data. By integrating Optical Character Recognition (OCR) with advanced Natural Language Processing (NLP) techniques, the system accurately extracts relevant information from hand written and printed medical documents. Leveraging Google Firebase for real-time data storage and retrieval, and utilizing ngrok for secure remote access, IntelliOCR provides a seamless and user-friendly experience. The system aims to enhance the accuracy, accessibility, and automation of medical data analysis, reducing manual workload and improving clinical decision-making. Through AI-driven insights, Intelli OCR supports healthcare professionals by streamlining administrative tasks and facilitating faster patient care.

KEYWORDS: OCR, Medical Document Analysis, Artificial Intelligence, NLP, Google Firebase, Automation, Healthcare

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INSTITUTIONAL EVENT AND TASKMANAGEMENT SYSTEM

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ABSTRACT

The Institutional Activity Management System is a digital platform aimed at simplifying and optimizing the process of managing institutional events. By replacing outdated paper-based processes, the system automates key steps such as event submission, approval, and tracking. This shift from manual methods to an automated system enhances efficiency, reduces errors, and ensures smoother management of institutional events. Faculty members can easily submit event details through an online form, which includes information such as the event name, coordinator, department, target audience, and event type. Once submitted, the system automatically routes the request to the appropriate administrators for review. Administrators assess the event based on institutional criteria and either approve or reject the submission. Furthermore, the system centralizes event records into a secure digital repository, where both faculty and administrators can access past and current event details. By storing all event-related documents in one location, the platform minimizes the risks of data loss and eliminates the need for physical record-keeping. The system's secure infrastructure ensures that all sensitive data is protected from unauthorized access, keeping institutional information safe and confidential. In conclusion, the Institutional Activity Management System provides an efficient, automated solution for managing institutional events. It improves communication, streamlines the approval process, and ensures secures to rage of event records. By replacing inefficient manual processes, the system enhances both faculty and administrative operations, driving institutional productivity and organizational success.

KEYWORDS: Assignment Management, Academic Integrity, Student Portal, Excel Storage, Question Bank, Learning Resources, Calendar Component, Deadline Reminders, Discussion Forum, Smart Assignment

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COLLEGE ADMISSION SYSTEM

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ABSTRACT

A comprehensive, automated solution, the College Admission System was created to make the admissions process for educational institutions more efficient and straightforward. Manual processing is frequently used in traditional admissions procedures, which can be laborious, prone to errors, and ineffective. By using technology to digitize and automate processes, this system makes the application process easier for administrative staff and candidates alike. Through the system's online portal, candidates can upload required documents, submit their applications, and monitor their admission status in real time. It includes functions like document verification, eligibility checks, administrative workload reduction, and transparency and equity assurance.

KEYWORDS: Web Application, College Admission, Seat Allotment, Management.

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SMART REUSED BOOK TRADING SYSTEM

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ABSTRACT

In today's digital age, books remain an essential source of knowledge for individuals eager to learn. This web application functions as an online bookstore where users can conveniently buy and sell pre-owned books from the comfort of their homes. By providing an efficient platform, the system enables users to search for books at affordable prices within an extensive digital library.

The existing system lacks an online solution for ordering second-hand books. Traditionally, individuals must visit physical bookstores or vendors to purchase the books they need, which demands both time and effort. Additionally, store owners must manually manage customer transactions, making the process cumbersome and inefficient.

The proposed system introduces a web-based distributed application accessible via a browser, allowing users to place orders anytime. Orders are processed efficiently, ensuring timely delivery. Furthermore, this system eliminates delays in payment processing, as users no longer need to wait in long queues to complete transactions. Searching for books becomes significantly faster and more efficient compared to manual methods, enhancing the overall user experience.

KEYWORDS: Rehashed Books, Online Book store, Literary Innovation, Second-hand Books, Digital Market place.

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ESTATE EASE: A PLATFORM TO SIMPLIFY PROPERTY LISTINGS AND MANAGEMENT

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ABSTRACT

The Online Real Estate Management System is a dynamic web-based platform designed to digitize and simplify real estate processes for various user roles—Users, Document Writers (Register Officers), and Admins. The system addresses common challenges in traditional property dealings by offering a centralized solution for listing, searching, and managing properties. Users can register and log in upon admin approval, upload property details (land or flats), explore listings using filters, request properties, make payments, and track owned or requested assets. Document Writers, after admin approval, are responsible for managing documentation related to property transactions, ensuring a smoother registration process. Admins oversee the platform, handling approvals, monitoring activities, and maintaining system integrity. The system also features a chatbot-powered help desk to offer real-time assistance and improve communication across users. Developed using modern web technologies, it ensures user-friendly navigation, scalability, and efficiency. The platform facilitates faster property transactions by streamlining key processes and reducing manual effort in real estate management.

KEYWORDS: Real Estate Platform, Property Management System, Document Writers, Online Property Registration, Chatbot Support

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LEARNING TO IMPROVE CAREER USING E-LEARNING PLATFORM

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ABSTRACT

The E-Learning Hub is a comprehensive online learning platform designed to enhance digital education by providing an efficient and interactive environment for both administrators and students. Developed using Java Spring Boot, React.js, and MySQL, the platform ensures seamless course management, assignment tracking, and student engagement. It facilitates structured learning by offering both technical courses such as C, C++, Java, and Python, and non-technical courses, catering to a widerange of learners. The platform includes an Admin module that enables administrators to login securely, manage courses, assign assignments, conduct and evaluate tests, provide practice papers, and track student progress. Additionally, it allows admins to manage job notifications, placement opportunities, and career resources, ensuring that students not only gain knowledge but also receive essential career guidance. By maintaining a centralized system, administrators can efficiently update course content, monitor student performance, and streamline the overall learning process. Students can register on the platform to explore available courses, access assignments, and interact with a variety of learning materials, including videos, PDFs, documentation, and blogs. The system provides an engaging and structured approach to education, ensuring that students have access to both academic and career-oriented resources. It supports a dynamic learning experience by integrating interactive content, automated assessments, and career guidance, ensuring a holistic approach to education. By bridging the gap between academics and career opportunities, the platform empowers learners with the knowledge and resources needed for both professional and personal growth.

KEYWORDS: Interactive learning platform, course management, online education, career guidance, placement resources, technical and non-technical courses.

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PLANET CONSERVATION – TOGETHER FOR A BETTER TOMORROW

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ABSTRACT

This project is an innovative web platform designed to foster environmental awareness and sustainability by connecting individuals, organizations, and eco-conscious businesses. The platform provides a space where users can participate in environmental discussions, share ecofriendly initiatives, and engage with a community dedicated to sustainable living. Through its various features, including an event spage, an eco-store for sustainable products, and a community- driven forum, it encourages collaboration and proactive environmental action. The system is built with a user-friendly interface, robust security measures, and efficient database management to ensure seamless interaction. By integrating modern web technologies, also aims to bridge the gap between environmental enthusiasts and actionable sustainability efforts, ultimately contributing to a greener and more informed society. Additionally, it provides an engaging platform for users to explore environmental challenges, discover innovative solutions, and take meaningful steps toward conservation. With its structured approach, this aspires to become a central hub for sustainability- driven conversations and activities worldwide.

KEYWORDS: Sustainability, Environmental Awareness, Eco-Friendly Platform, Community Engagement, Green Initiatives, Online Collaboration, Web Technology, Conservation.

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ORGAN TRANSPLANTATION SYSTEM SECURE DONOR-PATIENT MATCHING USING BLOCK CHAIN

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ABSTRACT

In this project Organ Matching and transplantation, we are using Blockchain Technology to handle hospital, donor and patient's (user details). Hospitals will be responsible to log all donors and user details and then search for match between donor and user and once matched found then alert will be sent to both users and donors. Both donor and user can monitor matched status using their ID provided by hospital peoples. Various hospitals can register and then login to application to maintain all donor and user information. Earlier there were centralized servers which were used to save all the user information and this server will be handled by admins who can have complete access to database and they can tamper or see details very easily and there is no direct method for the users to know about data leakage or tamper. Centralized servers can be easily attacked by hackers and can crash or steal information from servers and in such a case, server will be unavailable and services will be disrupted for users. To avoid all above problems all applications are shifting to decentralized Blockchain services because Blockchain has inbuilt data encryption support and store every data as block or transaction and assign each block with unique hash code and while storing new Blocks it will check hash code of all previous blocks and if data is not tamper then it will lead to same hash code and verification will become successful and if change then verification get failed and because of this reason Blockchain will be regarded as immutable. Blockchain is known as decentralized, i.e., Blockchain store data at multiple servers or node and if one server is down then it can access services from other working nodes. Blockchain deal with all data through smart contract and this contract will be developed through Solidity programming. Smart contract has a functionality to save and retrieve data from Blockchain. In propose work to manage hospital details we have designed following smart contract's function.

KEYWORDS: Hospitals, Donors, Patients, View transplantation, Blockchain.

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BLUSYNC CHAT APP

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ABSTRACT

Due to the increasing need for reliable and secure short-range messaging, Bluetooth-based messenger applications have turned out to be an economical alternative. The current paper documents the design and implementation of an Advanced Messenger Application based on Bluetooth providing peer-to-peer messaging with or without internet access. The application is configured to provide real-time text as well as multimedia messaging with secure and reliable data exchange between neighbouring devices. It is particularly useful when internet connectivity is limited or absent, such as in remote areas, crisis situations, or security areas. The system integrates an efficient matching algorithm, robust encryption for data security, and a simple interface to provide an excellent user experience. Performance testing highlights the application's minimal latency, efficient power consumption, and reliable data transfer to qualify it as an excellent alternative to traditional messaging apps. The application is designed to guarantee safe transmission of data using encryption methods, increasing the confidentiality of user messages. It is also capable of connecting multiple devices, which enable group messaging within a radius of 10 meters. The system is light weighted, having low battery and processing requirements, thereby best suited for mobile applications. By doing away with the reliance on network service providers, this application offers an affordable and efficient means of communication to users in regions with poor networks.

KEYWORDS: Bluetooth, Peer-to-Peer Communication, Secure Messaging, Offline Messaging, Real-time Data Exchange

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SMART GUARD: IOT BASED WOMEN SAFETY DEVICE

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ABSTRACT

The proposed project focuses on the development of a discreet wearable IoT device, such as a ring or bangle, aimed at enhancing women's safety through advanced technological integration. The device is designed to be inconspicuous, allowing women to carry a hidden tool that can activate crucial safety features in threatening situations without alerting potential attackers. This wearable will incorporate a range of components, including the ESP32, known for its low power consumption and built-in Wi-Fi capability, which allows for real-time data transmission. The inclusion of a miniature hidden camera enables discreet video capture, with footage sent to emergency contacts automatically or manually. To provide continuous safety monitoring, the device will be equipped with a GPS module, such as the NEO-6M, which will enable real-time location tracking. If the user encounters a dangerous situation, a discreet SOS button embedded within the wearable can be pressed to trigger alerts. These alerts, which include the user's location and other vital data, will be sent to pre-set emergency contacts. Additionally, the device will track the wearer's movements and can automatically send alerts if abnormal patterns are detected, such as sudden immobility. For connectivity, the device will utilize Wi-Fi, allowing it to maintain a reliable connection to nearby smartphones or directly to the internet, even in areas with limited connectivity. The wearable will be powered by a rechargeable lithium-ion battery designed for extended use, ensuring that the device can function continuously without frequent recharging. A companion mobile interface will be developed for Android and iOS through Telegram, offering users a simple interface to configure emergency contacts, view real-time location, and access camera footage. Data such as location and video recordings will be stored securely using Telegram's data servers, which helps us provide dynamic storage without any additional database setup, with end-to-end encryption ensuring user privacy.

KEYWORDS: Wearable IoT device, women's safety, hidden camera, GPS tracking, emergency alerts, ESP32, Bluetooth Low Energy, real-time location sharing, SOS button, microcontroller.

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EVERY DAY CLASSROOM EXPERIENCE TRACKER

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ABSTRACT

Collective feedback from the students regarding their learning experience remains the most important indicator for the educational service. Day-by-Day Classroom Learning Experience Tracker (DCET): A New Feedback Approach Based on Subject Teaching Performance Related to Students' Daily Learning Activities. Technologies: HTML, CSS, JavaScript, PHP and MySQL (PHP MyAdmin). It has been designed to provide a very basic interface and an easy to apply method for the improvement of the teachers' methods of instruction. This system assures the capture and retention of currently available information which allows the administrators and faculty to track progress over time. Implementation of the system assists education transformation by pinpointing DCET's strengths and weaknesses. DCET also provides for strong user authentication and access control for effective data security and integrity from unauthorized access. There is a combination of web technology application and the insight from databases which strive to close the gap in communication between educators and learners coming together for a responsive learning environment. This paper report is concerned with the design, implementation, and eventual outcome of the DCET in improving the classroom experience and teaching performance. DCET features help provide the teachers with better insight on the feedback given by the students. The system employs automatic data processing to capture enduring problems that can easily be fixed to improve teaching performance.

KEYWORDS: Student Feedback System, Web Application, Educational Improvement, Teaching Effectiveness, Interactive teaching, Classroom Experience, Teaching goals.

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VEHICLE RENTAL MANAGEMENT SYSTEM

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ABSTRACT

The Vehicle Rental System is an innovative and user-friendly web-based application to revolutionize the vehicle rental industry. This comprehensive platform offers a wide range of vehicles available for rent, catering to diverse customer preferences. With a two-module architecture, the system empowers vehicle owners and customers to engage in the rental process. The Owner module allows vehicle owners to register on the platform and efficiently manage their fleet. Owners can add and update detailed vehicle information, including vehicle type, model, year, rental rates, and availability. The intuitive interface facilitates easy management of vehicle listings, ensuring accurate and up-to-date information for potential customers. Additionally, owners can effectively handle rental requests and confirm bookings, streamlining their rental business operations. The Customer module provides a user-friendly interface for customers to explore the vast selection of available vehicles. Through advanced search and filtering functionalities, customers can find vehicles that match their specific requirements, such as car type, model, rental duration, and pricing. Once customers identify a suitable vehicle, they can seamlessly book it by submitting rental requests, and vehicle owners promptly process them. In conclusion, the Vehicle Rental System redefines the vehicle rental experience by providing a feature-rich and efficient platform for vehicle owners and customers. Through its comprehensive vehicle management and booking functionalities, the system optimizes rental processes, resulting in improved customer satisfaction and stream lined business operations for owners. The secure and user-friendly nature of the system positions it as an indispensable tool in the vehicle rental industry, poised to elevate the rental experience and shape the future of vehicle rentals.

KEYWORDS: Vehicle rental, live chat assistance, Dynamic pricing, Online booking, Real time vehicle status.

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ELECTRIC VEHICLE CHARGING STATION FINDER AND SLOT BOOKING

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ABSTRACT

The Electric Vehicle (EV) Charging Station Finder and Slot Booking Web Application is designed to help users efficiently locate and reserve charging slots. The system provides a user-friendly interface to search for nearby charging stations based on city, distance, or real-time availability. Users can filter stations, select slot types (fast/slow charging), and book slots based on date and time. The application integrates Google Maps for station locations and allows users to update their current location for better search results. Users can view booking history, receive notifications for upcoming bookings, and get charging status alerts. The platform also includes a review and rating system to help users choose the best stations. For administrators, the system provides tools to manage stations and slots, adjust pricing dynamically, and monitor station health (available, occupied, under maintenance). Admins can also generate reports on usage and revenue, set maintenance alerts, and offer discounts to users.

Keywords: Charging Station Finder, Slot Booking System, Google Maps Integration, Dynamic Pricing, Location-Based Search, Maintenance Alerts, Charging Status Alerts, Station Health Monitoring, Electric Vehicle.

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ACTIVITY POINT PROGRAM MANAGEMENT

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Abstract

The Activity Point Program Management is a sophisticated platform designed to streamline application management workflows by introducing various automation features, enhanced security measures, and role-based access control. This system addresses the complexities associated with app submission and approval processes, ultimately improving operational efficiency and reducing manual errors. One of the key features of the App Management System is its role-based access control (RBAC) mechanism. This functionality ensures that users have access only to the resources necessary for their roles within the organization. By delineating permissions across different user groups, the system enhances security while maintaining a clear structure for application management. The App Management System incorporates extensive automation features that simplify the app submission and approval processes. By automating routine tasks, such as notifications and status updates, the system minimizes the time spent on manual This automation not only accelerates the workflow but also enhances user satisfaction by providing timely information regarding their submissions. The system's ability to automatically route applications based on predefined criteria further optimizes the approval process, ensuring that requests are handled efficiently. Additionally, the system integrates various analytics tools that provide insights into application management workflows.

Keywords: Accreditation, Automation, Web Application, Student Evaluation, College Management.

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STUDYBUDDY: AN AI-POWERED ROBOT FOR STUDY ASSISTANCE AND INTERVIEW PREPARATION

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ABSTRACT

Artificial intelligence (AI) is being used more and more in education. Interactive AI systems transforms educational procedures. StudyBuddy, our suggested AI-based voice-interactive system, serves as interviewer and learning companion. To deploy the system, we require Google's Generative AI (Gemini 1.5) for response generation, Speech Recognition for processing voice input, and Raspberry Pi-based hardware for live feedback. There are two learn modes available here: to listen to explanations and advice (mode "Study Buddy") and to practice by taking virtual interviews (mode "Interviewer"). Visual feedback at different stages of operation (listening, processing, and replying) is given in the form of LEDs. In "Interviewer" mode, responses from the users are graded, feedback is provided, and the performance of the user is scored. Paper analyzes system architecture, implementation plan, evaluation metrics and improvement features like support for multiple languages, emotion detection and AI-based personalized learning trajectories. Comparative evaluation against the current AI tutors shows greater adaptability and user interaction of StudyBuddy.

KEYWORDS: AI Tutor, StudyBuddy, Interviewer Mode, Raspberry Pi, Speech Recognition, Generative AI, Personalized Learning.

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SMART MENTOR

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ABSTRACT

Mentorship is a crucial element in academic development, yet traditional methods often face challenges such as inefficient scheduling, lack of structured feedback, and difficulty in tracking student progress. To streamline this process, we propose the NECN Student Mentoring System, a web-based solution developed using the MERN stack to facilitate seamless communication and effective mentorship. The system is divided into three key modules: Admin, which assigns mentors to students and oversees session management; Teacher, which enables faculty to schedule and conduct mentoring sessions, share study materials, and track student progress; and Student, which allows mentees to access session details, submit feedback, and engage with shared resources. Additionally, the system incorporates a Parent Module, along with Student Marks and Attendance Tracking, ensuring a comprehensive academic support framework. Automated notifications help in maintaining regular interaction and timely session reminders. By integrating digital solutions into the mentoring process, this system enhances accessibility, fosters efficient mentor-student collaboration, and ensures continuous academic monitoring. The structured approach improves institutional mentoring practices, offering a scalable and user-friendly platform to support student success.

KEYWORDS: Mentorship, Academic Development, Student Mentoring, NECN Student Mentoring System, MERN stack, Web-based Solution, Seamless Communication, Effective Mentorship, Scheduling, Structured Feedback, Student Progress Tracking.

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CANINE HEALTH CONNECT: A DEEP LEARNING PROJECT ON STRAY DOGS

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ABSTRACT

Recommending an Android application that allows user registration, login, and dog health check-up through image capture. Users can take pictures of dogs and decide their health condition, classifying them as healthy or unhealthy. There is also a feature to locate NGOs in the vicinity to report animal care-related issues. Admins can update NGO listings such that reported problems are solved efficiently. The users are provided access to read other complaints and learn beneficial animal care warnings. The application is made to empower the users to help in animal welfare through reporting, connecting with the interested NGOs, and acquiring valuable information on responsible pet ownership. By providing simplified functionality, it fosters a community-based response to animal welfare campaigning and intervention.

KEYWORDS: Android app, Dog health assessment, Animal welfare, NGO locator, Petcare.

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SUBMIT SMART: A SHIFT TOWARDS SMARTER ACADEMIC MANAGEMENT

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ABSTRACT

The Smart Assignment Management System is a novel tool that allows students to conveniently organize and manage their academic workload. The system offers an Assignment Page where student scan checks their assignment calendars, track the progress of their assignments, and submit completed assignments in PDF form. Upon submission, student names, assignment descriptions, and submission dates along with times are stored in an Excelsheet for easy access. Students also receive email confirmations for every submission, while mentors are informed about new submissions. This way, mentors are able to track the students' progress and provide timely feedback. In order to maintain academic integrity, the system has restrictions, such as unique student ID numbers which prevent duplicate submissions and protect originality. Moreover, the platform provides a categorized Question Bank Page through which students can access a vast collection of questions that assist with exam preparation. This feature improves the students' ability to practice effectively, reinforcing their understanding of key topics. A Resources Page enhances the learning experience by presenting various types of e-books, hand written notes, video tutorials, and external links. These resources cater to further educator and student needs and different learning styles and accommodate each subject. The system also comes with a Calendar Component that tracks assignment due dates for automatic reminders one day in advance. This allows students to be pro-active with their academic activities. Additionally, the Discussion Forum encourages students to actively participate in academic discourse like asking for help or sharing information. This feature fosters collaborative learning among students while facilitating guidance as they strive to help one another solve problems as well as debate about the ideas presented. The combination of these services and tools into one system, the Smart Assignment Management System is easier to use than the previous ones. It provides better organization in learning activities, communication between learners and teachers, and overall education quality. Its interface and automation characteristics aid productivity as the student is fully engaged in the academic work instead of managing his/her academic responsibilities.

KEYWORDS: Assignment Management, Academic Integrity, Student Portal, Excel Storage, Question Bank, Learning Resources, Calendar Component, Deadline Reminders, Discussion Forum, Smart Assignment

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Dr. P. NARAYANA
Founder

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- Computer Science and Engineering (Artificial Intelligence and Machine Learning)
- Computer Science and Engineering (Data Science)

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