ICSTEM
14 March 2025

2025

INTERNATIONAL CONFERENCE ON

SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS 4.0

JANSONS Institute of Technology
Holistic Learning

DFTTI Design for test

ICSTEM-25

ORGANIZED BY

Jansons Institute of Technology, Coimbatore

in association with

DFTTraining Institute Private Limited, Bengaluru

ICSTEM25

Publisher: DFTTI Explore

DFTTI - Explore

978-93-48505-31-6

ICSTEM
14 March 2025

CONTENTS

Preface	iv
About ICSTEM	v
Objectives	vi
About DFTTI	vii
About JIT, COIMBATORE	viii
Messages	ix
Committee	xv
Abstracts Index	xviii

PREFACE

The Fourth International Conference on Science, Technology, Engineering and Mathematics 4.0 (ICSTEM-25) was organized by Jansons Institute of Technology, Coimbatore, India in association with DFTTraining Institute Private Limited (DFTTI), Bengaluru on 14th March 2025.

The ICSTEM-25 was a notable event that brought together academicians, researchers, engineers, industry experts and students. The purpose of this conference was to discuss applications and development in the area of Science, Technology, Engineering and Mathematics, which were given international relevance by DFTTraining Institute Private Limited (DFTTI).

This conference attracted over 150+ submissions. Through a rigorous peer-review process, 70+ high-quality papers were recommended by the committee. The conference aptly focused on the tools and techniques for advancements in science, technology, engineering and mathematics.

We are indebted to the efforts of all the reviewers whose efforts undoubtedly enhanced the quality of the proceedings. We sincerely thank all the authors who contributed their research work to the conference. We extend our heartfelt gratitude to the management for their wholehearted support and encouragement. We also thank our principal for his continuous guidance. Furthermore, we are grateful for the cooperative advice and insights from our advisory chair and co-chairs. Special thanks to all the members of our local organizing committee, as well as national and international advisory committees.

About ICSTEM

The recent advancements in the domains like Science, Technology, Engineering and Mathematics have led to exponential growth across various sectors including manufacturing and optimization techniques, new product design and development, renewable energy, smart grids, Internet of Things, big data, embedded technologies, industrial automation, robotics, structures & construction, remote sensing & GIS applications etc. Energy efficient green technologies are being explored to deliver improved and cost-effective solutions across these sectors.

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

All submitted papers will undergo peer review, and all original submissions will be checked for plagiarism. Both academia and industry are invited to submit their papers highlighting the state-of-art research and developments. The technical program of the conference will include keynote speeches and regular technical sessions.

This conference is expected to positively impact rural communities, thereby contributing to the inclusive growth of the country. It also aims to provide new research ideas to young researchers and entrepreneurs across the globe, fostering job creation in engineering sector. Furthermore, it will facilitate knowledge exchange in various domains within the emerging field of science and engineering. In addition, the conference will help the delegates identify new research directions and establish a roadmap for future exploration in these fields.

OBJECTIVES

The conference aims to bring together leading academicians, scientists, researchers and research scholars to exchange and share their experiences and research results in all aspects of Communication, Computing and Industrial Engineering toward sustainable development. The conference seeks to convene experts from various domains to enhance knowledge of innovative technologies and present new research findings, thereby promoting global scientific and community collaborations in synergy with other Professional Associations.

Environmental responsibility, economic efficiency, social solidarity, digital transformations are not only the avenues but also the essential needs of modern business sectors. Achieving the desired sustainable development through digital transformation appears to be impractical without cultivating critical thinkers and skilled agents of a sustainable future.

The conference aims to facilitate the pursuit of sustainable development through digital transformation, innovations and the modernization of relevant systems and structures. These efforts will, in turn, support individuals in becoming active contributors to more peaceful and sustainable societies, while fostering a sense of responsibility for our planet.

Benefits To Delegates Attending the Conference: (Authors Benefits):

- Conference proceedings will be published with an ISBN.
- Opportunity to publish article in high impact factor journals.
- Recommendations and comments will be considered for the best paper award.
- Original research work/findings will be published.
- A platform for researchers to showcase and explore their expertise.
- Appreciation and Recognition for outstanding contributions.
- Valuable feedback and networking opportunities with peers and experts.
- Insight into the latest trends and advancements in their respective fields.

About DFTTI

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

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

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

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

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

About JIT

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

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

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

Thirteen Batches of students were passed out with good Academic, Co-Curricular and Extracurricular achievements till the academic year 2024-2025. Teaching and Learning process at JIT is taken care by a set of learned, committed and well experienced faculty members. There are 25 faculty members with Ph.D. qualification and 18 faculty members are pursuing their doctoral degree in the Institution.

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

JIT received funds for conducting conferences, seminars, and technical workshops from various organizations, including DST, IEEE MGA India Strategic Initiative–USA, IEEE Madras Section, IEEE MAS Young Professionals Affinity Group, the Indian Council for Medical Research (ICMR), the Indian National Science Academy (INSA), the National Board for Higher Mathematics (NBHM), and the Department of Atomic Energy.

JIT also conducted the IEEE Coimbatore Hub Congress, which was fully funded by IEEE MGA India and the Ministry of Skill Development and Entrepreneurship (MSDE).

In addition, JIT received funding to carry out research and startup activities from AICTE under the Grant Support to Innovations–MIC Scheme for Innovation; from the Government of Tamil Nadu under TANSEED 6.0, EDII schemes; as well as from the NASSCOM Foundation, StartupTN, Kerala Startup Mission, and IIT Kanpur.

Rtn. MPHF. Shri. T. S. Natarajan
Chairman

Jansons Institute of Technology,
Coimbatore, India

Chairman's Message

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

- Martin Luther King, Jr

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

Best Wishes...!!

Shri. T. N. Kalaimani
Vice-Chairman

Jansons Institute of Technology,
Coimbatore, India

Vice Chairman's Message

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

- Anthony J. D'Angelo

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

Best Wishes...!!

Shri. T. N. Thirukumar
Vice-Chairman

Jansons Institute of Technology,
Coimbatore, India

Vice Chairman's Message

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

- Anthony J. D'Angelo

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

Best Wishes…!!

Dr. Murugeswaran Surulivel
Founder

DFTTraining Institute Private Limited,
Bengaluru, India

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

- Mike Schmoker

On behalf of DFTTI, Bengaluru and the organizing committee, I extend my sincere gratitude to all of you for your invaluable contributions to the success of the International Conference on Science, Technology, Engineering, and Mathematics 4.0 (ICSTEM-2025).

Your dedication, enthusiasm, and expertise made ICSTEM-2025 a truly enriching and enlightening experience for all involved. The exchange of ideas, discussions, and insights shared during the conference have undoubtedly contributed to the advancement of knowledge in our respective fields.

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

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

Once again, thank you for making ICSTEM-2025 a resounding success. We look forward to your continued involvement and participation in future endeavors aimed at advancing science, technology, engineering, and mathematics for the betterment of society.

Mr. Balasubramanian D P
Senior DFT Engineer

Sintegra Inc., Taipei City, Taiwan

Experienced Assistant Professor with demonstrated industrial experience in the field of VLSI Design. A former education professional holding a Master of Engineering (M.Eng.) in VLSI Design, with extensive expertise in Design-for-Testability (DFT). Previously worked as an Advanced Consultant/Engineer-L2 in leading technology firms such as Altran Technologies and MTS EdgeQ. With a deep understanding of the entire DFT flow, the speaker brings expertise in defining and implementing block-level and SoC-level DFT architecture, designing and verifying DFT RTLs, setting up MBIST, Scan, and Boundary Scan (BSCAN) flows, inserting MBIST at the RTL level, implementing Boundary Scan for board-level testing, scan insertion, scan compression analysis, ATPG pattern generation and coverage improvement, test point insertion, and simulation validation. Additionally, post-silicon debug on Automated Test Equipment (ATE) using ATPG-delivered pattern files, test time and pattern count reduction analysis, and collaboration with cross-functional teams for seamless DFT infrastructure integration and synthesis are among the speaker's key competencies.

Having hands-on experience with industry-standard EDA tools such as Mentor Graphics Tessent Shell Tool Suite and Cadence environment, the speaker has also developed automation solutions using Perl scripting for automating the generation of DFT RTLs and log file analysis for efficient debugging and optimization. The ability to work on scan insertion, ATPG pattern generation, simulation validation, and test coverage analysis showcases the speaker's expertise in enhancing design efficiency and testability.

Bringing together academic knowledge and real-world industrial experience, this keynote will provide valuable insights into the latest trends, best practices, and innovations in Design-for-Testability. The session aims to help professionals and students bridge the gap between theoretical knowledge and practical application, empowering them with the skills needed to excel in the semiconductor industry.

Mr. Giridhar Meruvala
Group Project Engineer

HCL Technologies, Chennai

A highly experienced professional with 18+ years of expertise, he has established a strong reputation in system study, development, project/program management, and technical leadership. With extensive experience in Java Web Technologies across domains such as telecommunications, aerospace, healthcare, insurance, and finance, he has successfully led enhancement projects from inception to implementation. Their strategic role in onshore/offshore collaboration and adherence to industry best practices, including CMMi QA processes and Safe Agile methodologies, has consistently driven operational excellence.

As a Certified Project Management Professional (PMP), ITIL, Azure, AWS Practitioner, and SaFE-POPM certified expert, he has demonstrated exceptional leadership in managing development, support, and migration projects. Their expertise in project estimation techniques, process optimization, and Six Sigma Green Belt implementation has significantly improved project efficiency. Additionally, their ability to troubleshoot complex challenges and lead teams effectively has been instrumental in ensuring project success and seamless execution.

A recognized thought leader, he has been a keynote speaker at various industry events, sharing insights on project management best practices, Agile methodologies, and technological advancements. Their ability to translate complex concepts into actionable strategies has inspired professionals and organizations to adopt innovative approaches for business growth. Through their impactful presentations, he continues to contribute to the professional development of the industry.

COMMITTEE

CHIEF PATRON

RTN. MPHF. SHRI. T.S. NATARAJAN
Chairman, Jansons Institute of Technology, Coimbatore, India

PATRONS

SHRI. T. N. KALAIMANI
Vice Chairman, Jansons Institute of Technology, Coimbatore, India

SHRI. T. N. THIRUKUMAR
Vice-Chairman, Jansons Institute of Technology, Coimbatore, India

STEERING COMMITTEE CHAIR

DR. V. NAGARAJAN
Principal, Convener, Jansons Institute of Technology, Coimbatore, India

STEERING COMMITTEE MEMBERS

DR.S. ELANGOVAN
Vice Principal, Co-Convener, Jansons Institute of Technology, Coimbatore, India

DR. M.V. SURESHKUMAR
Head - S & H and Director Administrations, Co-Convener, Jansons Institute of Technology, Coimbatore, India

DR.M. MUTHUKUMARAN
Prof. & HOD - Mech, Co-Convener, Jansons Institute of Technology, Coimbatore, India

ORGANIZING COMMITTEE

DR.S. ELANGOVAN
Prof. & Head-AI & DS, Jansons Institute of Technology, Coimbatore, India

PROF. L. AGNES PREETHI
Prof. & Head-Civil, Jansons Institute of Technology, Coimbatore, India

DR.A. VELAYUDHAM
Prof. & Head - CSE, Jansons Institute of Technology, Coimbatore, India

DR.G. VETRICHELVI
Prof. & Head - ECE, Jansons Institute of Technology, Coimbatore, India

DR.B. SENTHILNATHAN
Prof. & Head - Maths, Jansons Institute of Technology, Coimbatore, India

DR.R. SENJUDARVANNAN
Prof. & Head - Physics, Jansons Institute of Technology, Coimbatore, India

DR. S. SUPRIYA
Prof. & Head - Chemistry, Jansons Institute of Technology, Coimbatore, India

Ms. P. THAMILARASI
AP - English, Jansons Institute of Technology, Coimbatore, India

DR.T. MEENAKSHI
Prof. & Head - IIC, Jansons Institute of Technology, Coimbatore, India

PUBLICATION COMMITTEE

MRS.JANSIRANI S, AP/ CSE
MRS.BALAKIRUBA J, AP/ CSBS
MR.N. BALASUBRAMANIAM, AP/CIVIL
MR.V. SARAVANAKUMAR, AP/CIVIL
MRS. R. ASHWINI, AP/CSE
MR.V. PRASATH KUMAR, AP/CSE
DR.E. S. SHAMILA, PROF/CSE
PROF. A. PRAVEENA, AP/CSE
DR. S. USHA, ASP/CSE
DR.C. SHANMUGAM, ASP / ECE
DR.N. KRISHNAPRIYA, AP/ECE
MRS. V. VIDHYAGOWRI, AP/ECE
DR.M. M. MATHESWARAN, ASP/MECH
DR.L. ANOJKUMAR, ASP/MECH
DR.K. SENTHAMILSELVAN, PROF/CHEMISTRY
MRS. P. KAVITHA, AP/MATHS
DR.M. RAJU, AP/MATHS
DR. R. SENJUDARVANNAN, PROF/PHYSICS

TECHNICAL COMMITTEE

DR.S. ELANGOVAN, HOD / AI&DS
PROF. L. AGNES PREETHI, HOD / CIVIL
DR.A. VELAYUDHAM, HOD / CSE
DR.T. MEENAKSHI, HEAD /IIC
DR.M. MUTHUKUMARAN, HOD / MECH
DR.S. SUPRIYA, HOD / CHEMISTRY
Ms. P. THAMILARASI, AP / ENGLISH
DR.B. SENTHILNATHAN, HOD/ MATHS
DR.R. SENJUDARVANNAN, HOD / PHYSICS
MRS. ESTHER PRIYA R, AP/ AI&DS
MRS.S. SHANMUGA PRIYA, AP/CIVIL
MR.M. SARAVANAKUMAR, AP/CSE
MRS.A.V. VISHNU PRIYA, AP/CSE
MR.S. PRAKASH, AP/ECE
MRS.S. SANDRA, AP/ECE
MR.M. MAGESH, AP/MECH
MR.V. MURALI, AP/MECH
MRS. M RAMYA, AP/MATHS
MR.V.C. THILAK RAJKUMAR, AP/MATHS

EVENT MANAGEMENT COMMITTEE

DR.M. PAVITHRA, AP/CSE
MRS. KRISHNAPRIYA M S, AP/ AI&DS
MS. N. DIVYA PRABHA, AP/CIVIL
MR.S.M. SRIHARI SHANKAR, AP/CSE
MRS.R. SAVITHA, AP/CSE
DR.P. SIVAMANI, AP/ECE
DR. K. MAHENDRAN, ASP/EEE
MR.F. ALEXANDER, AP/MECH
MR.K. MAADESH KUMAR, AP/MECH
MRS. N. NITHYA, AP/MATHS

COMMITTEE

NATIONAL ADVISORY COMMITTEE

DR. MEENAKSHI A. THALOR
Associate Professor & Head, Information Technology AISSMS's IOIT, Pune, Maharashtra, India
DR. N. NANDAKUMAR
Visiting Professor, Computer Science Engineering, Sreenivasa Institute of Technology and Management Studies, Andhra Pradesh, India
DR P. VAMSI KRISHNA
Visiting Professor, Mechanical Engineering NIT Warangal, Telangana, India
DR. CH. V. RAGHAVENDRAN
Visiting Professor, Information Technology Aditya College of Engineering and Technology Andhra Pradesh, India
DR. GOWRISHANKAR S
Visiting Professor, Computer Science Engineering Dr Ambedkar Institute of Technology, Karnataka, India
DR.S. SARAVANAN
Visiting Professor, Electrical & Electronics Engineering B V Raju Institute of Technology, Narsapur, Telangana, India
Mr. M. THIYAGARAJ
Visiting Professor, Computer Applications Nazareth College of Arts & Science Tamil Nadu, India
Mr. N. VIVEKANANDAN
Scientist, Central Water and Power Research Station R&D organization of Ministry of Jal Shakti Delhi, India
PROF. RAJSHEKHAR G RATHOD
Visiting Professor, Civil Engineering MIT School of Engineering, MIT ADT University, Pune Maharashtra, India
DR. SUNIL K. AGRAWAL
Professor, Management Studies People's Institute of Management & Research Madhya Pradesh, India
Mr. T. L. SINGAL
Professor, Electronics & Communication Engineering Chitkara University Institute of Engineering and Technology, Punjab, India
DR. NITEEN L. BHIRUD
Dean Academics & Professor, Mechanical Engineering Sandip Institute of Engineering and Management, Maharashtra, India
DR. R. VALARMATHI
Professor, Computer Science Engineering Sri Sairam Engineering College Tamil Nadu, India
DR. VISWANATHA B. M.
Professor & Head, Mechanical Engineering Kalpataru Institute of Technology-Tiptur Karnataka, India
DR.R.UMA
Professor, Computer Science Engineering Sri SaiRam Engineering College Tamil Nadu, India

SCIENTIFIC COMMITTEE

DR. KUNDAN MESHRAM
Assistant Professor, Civil Engineering Guru Ghasidas Vishwavidyalaya, Chattisgarh, India
DR. M. VINOTH KUMAR
Associate Professor, Computer Science Engineering RV Institute of Te chnology & Management, Karnataka, India
DR. SMITHA SHEKAR B
Associate Professor, Computer Science Engineering Dr Ambedkar Institute of Technology, Karnataka, India
ASHARANI KP
Visiting Professor, Computer Science Engineering Dr Ambedkar Institute of Technology, Karnataka, India
DR. S. M. SUBASH
Associate Professor, Civil Engineering Guru Nanak Institute of Technology, Telangana, India
DR. SHRIKANT M. HARLE
Assistant Professor, Civil Engineering, Prof. Ram Meghe College of Engineering and Management, Amravati. Maharashtra, India
MOHD ASIM
Visiting Professor, Civil Engineering, Integral University, Lucknow, Uttar Pradesh, India
MS VEENA A
Assistant Professor, Computer Science Artificial Intelligence Dr Ambedkar Institute of Technology, Karnataka, India DR. AJAY
PANDURANGJI SHELORKAR
Assistant Professor, Civil Engineering MVPS, s KBT College of Engineering, Maharashtra, India
DR. KIRAN KUMAR B M
Assistant Professor, Electrical Engineering M S Ramaiah University of Applied Sciences, Karnataka, India DR. S. RAMADEVI

COMMITTEE

SCIENTIFIC COMMITTEE

BHOOBALAN
Assistant Professor, Biotechnology, Bon Secours College for Women, Thanjavur, Tamil Nadu, India
DR. VARTIKA SHARMA
Assistant Professor, Information Science & Engineering Vidyavardhaka College of Engineering, Mysore Karnataka, India
ER. SATISH KUMAR SHARMA
Assistant Professor, Mechanical Engineering M B S College of Engineering & Technology Jammu & Kashmir, India
REMYA P. NARAYANAN
Associate Professor, Science & Humanities Global Academy of Technology, Karnataka, India
CHINTAN PATEL
Program Manager, Big Data Analytics Adani Institute of Digital Technology Management Gujarat, India
DIVYA C.D
Program Manager, Software Testing Adani Institute of Digital Technology Management Gujarat, India
NAVANEETHA LAKSHMAN R
Research Specialist & Consultant, Environmental Science Future Bridge India Pvt. Ltd, Maharashtra, India
SULAKSHANA B. MANE
Assistant Professor, Computer Science Engineering Bharati Vidyapeeth College of Engineering Navi Mumbai. Maharashtra, India
DR. A. MEENAKSHI
Assistant Professor, Computer Science Engineering SRM Institute of Science & Technology Tamil Nadu, India
R. SHARMIKHA SREE
Visiting Professor, Computer Science Engineering Sri Sai Ram Engineering College, Tamil Nadu, India
S. MEERA
Assistant Professor, Computer Science Engineering Sairam Engineering College, Tamil Nadu, India
DR. VARTIKA SHARMA
Assistant Professor, Information Science & Engineering, Vidyavardhaka College of Engineering, Mysore, Karnataka, India

CONTENTS

ADVANCING EMERGENCY RESPONSE WITH AI-ENABLED DRONES FOR SURVIVOR DETECTION

DR PAVITHRA M [1], SHANJAY G [2], SHIVA ASHWATH BR [3], SRI RAGUL RAJ T [4] 1

FUND SPHERE: A SMART DIGITAL SOLUTION FOR EFFICIENT GROUP FUND MANAGEMENT

DR. PAVITHRA M [1], SAJITH G [2], PRAKASH S [3], SOWBARNIKA M[4] 3

REAL TIME THREAT DETECTION FOR WOMEN

A.V. VISHNU PRIYA [1], DEEKSHI S[2], GOWTHAMI M [3], KANIVARSHINI N[4], DHARANI PRIYAN E[5] 4

AI-BASED HYBRID EV ASSISTIVE SYSTEM FOR FUEL AND ELECTRIC SWITCHING

MS.R.SAVITHA[1], ALLURI VENKATA SATWIKA[2], GANDAVARAM LAKSHMI POOJITHA[3], GUNDAVARAM ABHINAYA[4], JEEVITHA P[5] 5

ADVANCED VEHICLE TO VEHICLE COMMUNICATION SYSTEM USING AI AND COGNITIVE RADIO TECHNOLOGY

MR. V.PRASATHKUMAR[1], ADDANKI POORNAVENKATASAI[2], AMMIREDDY NAVANEESHWAR REDDY[3], BELLAMKONDA HEMANTH[4], DEVIREDDY GANESH REDDY[5] 6

FOOT PRESSURE BASED MULTIPLE DISEASE DETECTION SYSTEM

MRS. R ASHWINI[1], SANJAY M[2], MANIKANTA P[3], RAJKUMAR P[4], TEJESH R[5] 7

HOME AUTOMATION AND SECURITY SYSTEM USING AI AND IOT

MRS. N. MARAGATHAM[1], J. MOHAMED JASSIM[2], D.B.MONISHWARAN[3], D. MUGESH[4], S.SURYA[5] 8

DRIVER DROWISNESS DETECTION AND AUTO VEHICLE CONTROLLING SYSTEM

MS .A. V. VISHNUPRIYA. M[1], YASWANTH.BV[2], SUMANTH DV[3], SAIRAJ. K[4] 9

RFID-ENABLED KINETIC ENERGY HARVESTING SYSTEM FOR SUSTAINABLE POWER GENERATION

DR. A VELAYUDHAM [1], NITISH RAJ [2], SANJAI K [3], R SAKTHIVEL [4] 10

SMART DETECTION OF ENERGY THEFT IN AGRICULTURAL SECTORS

MRS.R ASHWINI[1], KAVIGA D[2], ROHITHA M[3], SIVARANJANI G[4], GURU DEEPTHI V[5] 11

AUTOMATED LED ROAD LIGHTING SYSTEM FOR ENHANCED VISIBILITY IN HILLY REGIONS

DR PAVITHRA M[1], BALASURYA M[2], GOKULAKANNAN S.C[3], BABIDO MACMILLION[4], JOTHEESAN[5] 12

SMART HEAD-MOTION CONTROLLED WHEELCHAIR WITH WI-FI FOR QUADRIPLEGICS

DR VELAYUDHAM A[1], KAMESH R[2], DURAISARAVANAKKUMAR G[3], GOWTHAM R A[4], KARTHIKEYAN S[5] 13

OTP BASED WIRELESS CHARGING SYSTEM FOR E-VEHICLE ALONG WITH GEO LOCATION SYSTEM

MR. S M SRIHARI SHANKAR[1], ADAKA RAVI TEJA[2], BILLAKANTI SHREEJA RAO[3], BODDULURI NIKILESH [4], BOILLA RAGHU VARDHAN REDDY[5] 14

MACHINE LEARNING-DRIVEN SYSTEM FOR REAL-TIME AIR QUALITY MONITORING AND PREDICTION

DR. S. USHA[1], SADHARI VISWATEJA[2], VEMULA SIVA DILIP[3], R SUBHASH REDDY[4] 15

ADVANCED ULTRASONIC SMART CANE WITH VOICE ASSISTANCE FOR THE VISUALLY IMPAIRED

DR VELAYUDHAM A[1], HASWANTH S S [2], HARIHARAN P[3], HARIPRASATH S[4], DHIVAKAR M[5] 16

SMART MACHINE FAULT DETECTION SYSTEM USING IOT

DR.S.USHA[1], GORLA BHAGYA RAJ[2], CHILAKA YAMINI LAKSHMI[3], DAGADA PAVANII[4], KATUKURI VASANTH KUMAR[5] 17

LUNG MONITORING SYSTEM USING AI

MRS. R. SAVITHA[1] , MUCHELI LAHARI[2], R.SASIKUMAR[3], S.SRI SUKITHA REDDY [4], R.K.SHIVAANISREE[5] 18

STRESS BASED VEHICLE SPEED CONTROL USED IOT

DR.S.USHA[1], VAISHNAVI V[2], PAVITHRA C[3], MADHUMITHA P[4], VASAVI V[5] 19

CONTENTS

AUTOMATION AND SAFETY FOR AGRICULTURE AND FOREST CONSERVATION USING IOT

PRASATHKUMAR V[1], MOHNISH S[2], PRAKASH K[3], VIKRAM K S K[4] 20

VOICE CONTROLLED EV SYSTEM AND LOCKING SYSTEM WITH GESTURE BASED AUTHENTICATION

MRS A PRAVEENA[1], PUTALA BALANARAYANA[2], M AJAY[3], M S HARIHARASUDHAN[4], P JOHNDEV[5] 21

WILD ANIMAL MOVEMENT DETECTION AND ALERT SYSTEM

DR.A. PRAVEENA[1], M SAI MARUTHI KALYAN[2], MAHID BASHA SYED[3], N VENKATA SAI NIKHIL CHOWDARY[4], P LIKITH SRIKANTH[5] .. 22

DEVELOPMENT OF SEMI-AUTONOMOUS DRONE SYSTEMS FOR EFFICIENT DELIVERY OF MEDICAL SUPPLIES IN REMOTE AND DISASTER AREAS

MRS. A. PRAVEENA[1], ALLWIN SURESH[2], S. AJAY KUMAR[3], GUNA.M[4], GURUPRASATH.K[5] 23

SMART WEARABLE FOR DETECTING DEHYDRATION

MRS. N. MARAGATHAM[1], B. MANOJ KUMAR[2], CH.V. NIHAN ROYAL[3], J. PAVAN KUMAR[4], K. VENKATESH[5] 24

MULTIPLE DISEASE DETECTION SYSTEM USING SWEAT ANALYSIS

MRS.R ASHWINI , ARSHIKA G[2], ARULKUMAR R[3], CHENDHI DIVYA[4], DHARANIDHARAN S[5] 25

DEEP LEARNING-BASED AUTONOMOUS PREDICTIVE CARE IN INTELLIGENT TRANSPORTATION SYSTEMS

JANSIRANI S[1], SRUTHI SREE S G[2], SNEHA C[3], SUWETHA S[4], SHIFANA BEGUM[5] 26

A SELF-DIAGNOSIS MEDICAL CHATBOT

JANSIRANI S[1], K PAVANKUMAR[2], M SIDDU VINAY[3], B MOHAN RAO[4], M BHARATH[5] 27

SMART TRAFFIC SIGNAL SYSTEM FOR EMERGENCY VEHICLE CLEARENCE USING AI AND IOT

RAMYA M[1], B HEMANTH RAJ[2], G.JIGNESH[3], K. GNANESH REDDY[4], V. NIRANJAN KUMAR[5] 28

AIR QUALITY MONITORING SYSTEM IN A CAR USING ML

DR. S.ELANGOVAN[1], A.THARUN[2], B. KUSHYANTH REDDY[3], CH .M DINESH[4], M. SARASCHANDRA REDDY[5] 29

EARLY DETECTION OF DIABETES

MRS. M.S. KRISHNA PRIYA[1], KINNERA VAMSI VARDHAN[2], PULLURWAR SACHIN[3], PARAVA CHARAN REDDY[4], YENUGULA NAGA SAI SATHWIK[5] 30

AI-POWERED RAILSAFEBOT

DR. ELANGOVAN[1], KM.YEHAASARY[2], A. DEEPAK[3], N. DHARANIDHARAN[4], C. KAARTIKEYAN[5] 31

CLEANO – SMART DUSTBIN MANAGEMENT SYSTEM

PROF. M RAMYA[1], SHINDE VAIBHAV[2], KISSHORE N[3], AMARA CHIDVI SRI SANJANA[4], B HIMANTH[5] 32

CROP AND SOIL HEALTH PREDICTION FOR SUSTAINABLE AGRICULTURE

R ESTHER PRIYA[1], P YUVA VENKAT[2], M RAJASEKHAR REDDY[3], K SASIKALA4, K HAREESH[5] 34

AI – POWERED AGRICULTURAL DAMAGE ASSESSMENT SYSTEM

MRS. M. S. KRISHNA PRIYA[1], VISHAL RK[2], KOTA SHANMUGAM[3], UPPALA SHIVA[4], SANJEEVI P[5] 35

PETITION FLOW-AN AI POWERED PATH TO RESOLUTION

PROF. M S KRISHNA PRIYA[1], KISHORE S A[2], SOWNDHARYAN S J[3], EESWARAN H[4], JESHWANTH A[5] 36

ENHANCED SKIN CANCER DETECTION THROUGH ADVANCED HAIR SEGMENTATION AND REMOVAL TECHNIQUES

MRS. T.RAMYA[1], MS.A.BENASEER[2], I. SNEHA SANDHYA[3], K.POOJITHA[4], I.S.ANISHA[5], T.AISHWARYA[6] 37

CONTENTS

NON-INTRUSIVE DETECTION OF JAUNDICE IN NEONATAL USING DEEP LEARNING ALGORITHM

MRS.RAMYA T[1], BINDUBHAVYA G[2], KEVIN K[3], NITHISHWARAN NB[4], SARVETHA S[5] 38

REAL-TIME TEMPERATURE MONITORING AND DISEASE PREDICTION IN POULTRY FARMS

MRS. T RAMYA[1], DEEPAKRAJ R[2], RAMSURYA B[3], SURENDRANATH P[4] 39

REWARD BASED TRAFFIC COMPLIANCE SYSTEM

MS.R.ESTHER PRIYA[1], MS.A.BENASEER[2], K. STEVE JINO[3], M. KIRUTHIKA[4], S.MADHAN[5] 40

AI-POWERED CAREER AND SKILL RECOMMENDATION SYSTEM

DR. ELANGOVAN[1], ASWIN.S[2], DHARNESSH.S[3], SAFIR AHAMED. M[4], SHANMUGAKUMAR.L[5] 41

AUTOMATED NAVIGATION FOR UAV SIMULATION

MS. R ESTHER PRIYA[1], P AABHESHEK[2], T N ARUN[3], GARREPELLI VARSHINI[4], S SASIKUMAR[5] 42

INTEGRATED IOT SOLUTION FOR CONTINUOUS PATIENT VITAL SIGN MONITORING AND ALERTING

DR.K. MAHENDRAN[1], NAGI REDDY INDUVARDHAN REDDY[2], PACHIPULUSU SUBRAMANYA SREENIVASAN[3], TALARI CHARMI SHREYA[4], P.PREEM[5] 43

VEHICLE TO VEHICLE COMMUNICATION USING LI-FI TECHNOLOGY

DR.K. MAHENDRAN[1], A.RAMA SAI TEJASWINI[2], G. PRUTHIVI RAJ[3], B.AMARNADH[4], B. VISHWANATH[5] 44

EARLY WARNING SYSTEM FOR GLACIAL LAKE OUTBURST FLOOD

DR.N.KRISHNAPRIYA[1], P.DHANASRI[2], GADDAM JAYANTH BABU[3] JONNADULA VINAY KUMAR[4], S.KANNAN[5] 45

LORAWAN BASED TRANSFORMER MONITORING AND CONTROLLING USING MACHINE LEARNING

MR.S K. KABILESH[1], VESHNU M S[2], YELUVU SAI TEJA[3], PULLAKOMALA BHARATH[4], VIBIN ANTO[5] 46

IOT-BASED AUTOMATIC TICKETING SYSTEM FOR PUBLIC TRANSPORTATION USING GPS, RFID TAGS, AND ANDROID INTEGRATION .....

PROF S.SANDRA[1], PALLAPU BHASKAR[2], PARAMESHWARI L[3], SUBARNA C[4], UNNAM CHAITANYA[5] 47

DESIGN AND SIMULATION OF A SOLAR-POWERED ELECTRIC CAR CHARGING STATION

DR.P.SIVAMANI[1], P.VENKATA SAI NARASIMHA[2], N.JASWANTH RAJ[3], P.DEEPIKA[4],S.PHANI KUMAR[5] 48

IOT AND BLOCK CHAIN BASED DISTRIBUTED AGRICULTURE SYSTEM TO ASSIST SMART FARMING AND TRACK AUTHENTICITY OF FOOD SOURCE

PROF S.SANDRA[1], BOOMIJA. R. S[2], GODUGULURU SAYYAD BASHA[3], JANGUBAI KHAJA MAINUDDIN[4], KISHORE SELVAKUMAR[5] 49

SMART WEARABLE DEVICE FOR WOMEN'S SAFETY USING IOT

MRS.A.BERLIN[1], UMMADI RAMYA SREE[2] SHAIK MAHAMAD MOULI[3], V.BADRINATH[4], T. SUMANTH KENNY[5] 50

DEVELOPMENT OF AN ERGONOMIC HANDHELD FARMING TOOL FOR EFFICIENT SOIL PREPARATION AND REDUCED FARMER FATIGUE

DR. G. VETRICHELVI[1], MAHIBA V[2], LOGU PRAKASH V[3], NUSI RAKESH REDDY[4], TERLA SAI JASWANTH[5] 51

VITA TRACK: A WEARABLE DEVICE FOR CONTINUOUS HEALTH MONITORING AND EARLY WARNING SYSTEM

DR.G. VETRICHELVI[1], GOWTHAM R[2], ANURAG SINGH[3], BALA SIVA KRISHNA[4], INFANTA CHRISTINA LOURTHU MARY S[5] 52

PEDESTRIAN SAFETY SYSTEM FOR URBAN ENVIRONMENT

DR.P.SIVAMANI[1], DESU VENKATA DEEKSHITH REDDY[2], R MADHAVA KRISHNA[3], LIVYA S[4], J HIMA KIRAN[5] 53

LORA BASED GREEN HOUSE MONITORING AND CONTROL SYSTEM USING IOT

VIDHYA GOWRI V[1] , PRANESH S[2], PRIYADHARSHINI S[3], RAMABATHINA DINESH[4], PADUCHURI DATTUKUMAR[5] 54

CONTENTS

VISION AID: AN AI-DRIVEN ASSISTIVE SYSTEM FOR READING TEXT ON BRIGHT DISPLAYS AND OBJECT RECOGNITION FOR THE VISUALLY IMPAIRED

DR. C. SHANMUGAM[1], PASAM VENKATA RAMANJINEYULU[2], NADIPI BHARGAV[3], NOOR AARIFA[4], PATAN MAHAMMAD KHAN[5] 55

CHILD LIFE PROTECTION SYSTEM FROM UNSAFE BORE-WELL ZONE

DR.C. SHANMUGAM[1], HARSHINI K[2], AVINASH A[3], CHENCHAMGARI YESHAYA[4], CHERUKURI VEERA VENKATA GOPINADH[5] 56

WHEELS OF FREEDOM: THE GESTURE CONTROLLED WHEELCHAIR

V VIDHYA GOWRI[1], GUNTAMADUGU PAVAN KUMAR[2], HARIPRIYA V[3], KAJJURU TIRUMALESH[4], LAKSHMI NARAYANAN N[5] 57

INTELLIGUARD: ADVANCED SMART HELMET SYSTEM FOR MOTORCYCLES

K. KOKILA[1], AKSHAY.P[2], ATHIPATI PAVAN[3], CHALLAGUNDLA HARIKRISHNA[4], DIVYABHARATHI K[5] 58

AI-POWERED PRECISION AGRICULTURE FOR CLIMATE-RESILIENT FARMING

DR.P. SIVAMANI[1], NIVETHA G[2], NIVETHITHA G I[3] 59

NEXT GENERATION UAV COLLISION AVOIDANCE USING DOPPLER RADAR AND LIDAR SENSOR

DR.T. MEENAKSHI[1], GURRAM JAGADEESH[2], JAYASRI S[3], LOGESH M[4], KONDURU.LOKESH[5] 60

SMART IOT FRAMEWORK FOR CLIMATE RESPONSIVE MORINGA CULTIVATION USING MACHINE LEARNING

DR. N. KRISHNAPRIYA[1], MADANA VASUDA[2], MALLELA DANIEL RAJ[3], MANDLA SREERAM[4], S. PRANESH[5] 61

REAL-TIME 3-PHASE POWER MONITORING SYSTEM USING IOT

MR.S. PRAKASH[1], DHARSHANI B[2], HEMANTH PRASAATH K[3], BANDI MIDHUN[4] 62

INTELLIGENT SMART CARE BED FOR ELDERLY HEALTH MONITORING

MRS.K. KOKILA[1], CHALLA JAYAVARDHAN[2], DARSHAN S[3], HARIPRIYANGA V[4] 63

GAS PIPELINE SAFETY IN APARTMENTS USING LORAWAN TECHNOLOGY

PROF S. PRAKASH[1], RABIN RAM.R[2], RUBA.P[3], SHAIK FIROZ[4], SUJITH KHARSAN.G[5] 64

IOT BASED RFID DRIVEN EMERGEMCY VEHICLE PRIORITY SYSTEM

MRS.A. BERLIN[1], HARISH KUMAR K[2], KIRUBA E[3], GOWRI SIVA SAI CRP[4] 65

INNOVATIVE EMI MITIGATION TECHNIQUES FOR NEXT-GENERATION ELECTRONICS

C. SWEDHEETHA[1], V. MUNEESWARAN[2], K NARESH KUMAR[3] 66

SMART RESPIRATORY MONITORING: A WIRELESS SENSOR AND MACHINE LEARNING-BASED DIAGNOSTIC SYSTEM

P. MANIKANDAN[1], V. MUNEESWARAN[2], K NARESH KUMAR[3] 67

EXPLORING THE NATURAL COAGULANTS FOR WATER TREATMENT

MRS.L. AGNES PREETHI[1], K. VEERENDRA[2], P.SAI SRINIVAS[3], U. GOWTHAM KISHORE[4] 68

SMART IRRIGATION SYSTEM FOR PRECISION FARMING

MR. K. MAADESHKUMAR[1], R. BHARATH YADAV[2], J. SRI HARI[3], G. KARTHIK[4], CH. SAI VIRINCHI[5] 69

DESIGN, ANALYSIS & FABRICATION OF DRONE FRAME

J KIRAN[1], N SHARAN RAJ[2], K SUBASH CHANDRA BOSE[3], S BALASURYA[4] 70

DEVELOPMENT OF AUTO MECHANISM FOR SOLAR PANEL ROTATION TO GET EFFECTIVE TRACKING THE SUN MOVEMENT

MR. F. ALEXANDER[1], D. ISMAIL[2], E. VINAY REDDY[3], K. HAMSAVARDHAN REDDY[4], P. SIVA KIRAN KUMAR[5] 71

CONTENTS

SUSTAINABLE BIOFUEL PRODUCTION THROUGH BIOMASS CONVERSION

DR.M. MUTHUKUMARAN[1], P. VIGNESH[2], K. GOWTHAM[3], C. AMALRAJ[4], R. SUBASH[5] 72

EFFECTS OF STACK SEQUENCING ON WEAR PROPERTIES OF WOVEN HEMP/WOOL FABRIC REINFORCED COMPOSITE

PROF. S. J DAVID HANS[1], RAGUL RAJ G[2], KARAN LEANDER A[3], YUVAN SANJAY SG[4], BALAMURUGAN J[5] 73

AUTOMATIC MOTORIZED STAIRCASE CLIMBING SYSTEM FOR GOODS TRANSPORTATION

MR.V. MURALI[1], P. ARJUN[2], T. RAGAVAN[3], K.R. SIVA BALAN[4] 74

EXPERIMENTAL STUDY ON BEHAVIOUR OF PAVER BLOCK USING RECYCLED AGGREGATES WITH 10% OF FOUNDRY SAND

MRS.SHANMUGAPRIYA S[1], NAVEEN RAJ AM[2], NAQVI AHMED PH[3], SARATHKUMAR E[4], RAVI SHANKAR M[5] 75

BIM BASED SIMULATION AND ANALYSIS FOR SUSTAINABLE RESIDENTIAL BUILDING

MR. SARAVANA KUMAR V[1], HEBIC JOEL M[2], ABISHEK A[3], VISWANTH B[4] 76

DESIGN AND DEVELOPMENT OF MICRO DEEP DRAWING SYSTEM

P. GOPALAKRISHNAN[1], M. ARUN PRAKASH[2] 77

ADVANCING EMERGENCY RESPONSE WITH AI-ENABLED DRONES FOR SURVIVOR DETECTION

Dr Pavithra M [1], Shanjay G [2], Shiva Ashwath BR [3], Sri Ragul Raj T [4]

[1]Assistant Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-4] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

With the increasing frequency and severity of natural and human-induced disasters, the ability to swiftly locate and rescue survivors is crucial for saving lives. This project presents an AI-powered drone system designed to improve search and rescue (SAR) operations by addressing the limitations of traditional methods in challenging environments. Conventional rescue approaches often struggle in low-visibility conditions or hazardous terrains, where rapid and precise survivor detection is essential. Our solution integrates advanced drone technology with thermal imaging, IoT connectivity, and AI-based object detection models such as YOLO to identify and locate survivors in real time. The system processes thermal video feeds directly on the drone, enabling immediate analysis and identification of human heat signatures even in adverse weather or obscured visibility conditions. Once a survivor is detected, the drone calculates precise geographic coordinates (latitude and longitude) and transmits this information via an IoT network to a central command system. This ensures a swift and accurate response by rescue teams, minimizing delays between detection and intervention. Additionally, the system seamlessly integrates with existing emergency response infrastructures, providing dynamic, real-time data to enhance decision-making during critical missions. The robust IoT framework facilitates continuous communication between drones and SAR teams, enabling adaptive routing and real-time situational updates. This interconnected approach not only enhances the efficiency of rescue operations but also contributes to comprehensive disaster management by providing valuable insights into evolving scenarios. The AI-powered drone system is particularly effective in environments where conventional rescue efforts are obstructed by debris, smoke, or darkness. By automating the initial search process and accurately pinpointing survivor locations, our solution reduces risks to human rescuers and accelerates response times. Furthermore, the integration of historical data analysis allows for better prediction of high-risk zones, supporting proactive measures and optimized resource allocation in future operations. In summary, this project represents a significant advancement in emergency response technology by leveraging AI, drone technology, and IoT connectivity to enhance SAR operations. The system's ability to rapidly detect survivors and provide precise location data has the potential to transform disaster response strategies, ultimately saving more lives and reducing the overall impact of disasters on affected communities.

Keywords:

AI-powered drones, Search and Rescue (SAR), Thermal imaging, YOLO, CNN, IoT connectivity, Real-time survivor detection, Geo-location (latitude and longitude), Disaster response, Emergency management, Autonomous UAVs, Machine learning in SAR, Edge computing, Low-visibility rescue operations, Situational awareness, Real-time data transmission.

FUND SPHERE: A SMART DIGITAL SOLUTION FOR EFFICIENT GROUP FUND MANAGEMENT

Dr. Pavithra M [1], Sajith G [2], Prakash S [3], Sowbarnika M[4]

[1]Assistant Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-4] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Fund Sphere is a mobile application designed to simplify and enhance group fund management by providing an organized, automated, and secure financial tracking system. Traditional methods like spreadsheets and manual ledgers often result in mismanagement, lack of transparency, and inefficiencies due to delayed updates and errors. Fund Sphere addresses these challenges by enabling users to create groups, add members, track contributions, and monitor fund status in real time. It offers automated reminders, transaction logs, and structured financial records to ensure accountability and seamless fund tracking. Unlike generic expense-sharing applications, which focus on splitting costs, Fund Sphere is tailored for collaborative fund collection and management, making it ideal for community savings, rotating credit associations, subscription-based collections, and organizational fund pooling. The application prioritizes security with robust authentication protocols, encrypted data storage, and controlled user access to protect sensitive financial information. Its scalable and intuitive design ensures accessibility across different user groups, minimizing manual effort while improving financial clarity and discipline. By integrating automation, security, and a structured approach, Fund Sphere enhances transparency, reduces administrative burden, and offers a reliable solution for efficient and accountable group fund management.

Keywords:

Group Fund Management, Financial Automation, Digital Finance, Secure Transactions, Real-Time Updates, Collaborative Accounting, Scalable Platform, Contribution Monitoring, Fund Transparency, Expense Management, Financial Planning, Automated Record-Keeping.

REAL TIME THREAT DETECTION FOR WOMEN

A.V. Vishnu Priya [1], Deekshi S[2], Gowthami M [3], Kanivarshini N[4], Dharani Priyan E[5]

[1]Assistant Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Ensuring women's safety is a critical concern that necessitates innovative technological solutions. An IoT-based Women's Safety System has been developed to provide real-time monitoring and immediate emergency alerts in the face of potential threats. This system integrates several key components to enhance personal security. ESP32-CAM Module captures images during emergencies, uploading them to Google Drive for evidence collection. Arduino Uno serves as the central controller, managing inputs from various sensors and coordinating system responses. PIR Motion Sensor and Sound Sensor detect unusual movements and distress sounds, respectively, triggering alerts when potential threats are identified. NEO-6M GPS module provides real-time location tracking, enabling precise monitoring of the user's whereabouts. GSM module Upon activation, sends an SOS alert containing the user's location details to pre-configured emergency contacts, facilitating prompt assistance. In an emergency, the system can be activated manually by pressing a panic button or automatically through sensor detection of irregular activities. Once activated, the ESP32-CAM captures images of the surroundings, which are then uploaded to Google Drive for evidence preservation. Simultaneously, the GPS module acquires the current location coordinates, and the GSM module sends an SMS alert containing these coordinates to registered emergency contacts. This coordinated response ensures that the individual receives immediate assistance, and relevant data is available for responders. By integrating these components, the IoT-based Women's Safety System offers a robust solution for enhancing personal security. The system's ability to provide real-time monitoring, evidence collection, and rapid communication empowers women, providing them with the tools necessary to feel safe and protected in various environments.

Keywords:

Women Safety, IoT, ESP32-CAM, Arduino Uno, PIR Motion Sensor, Sound Sensor, NEO-6M GPS Module, GSM Module, Real-Time Monitoring, SOS Alert, Emergency Response, Google Drive Integration, Embedded Systems, Smart Security, Threat Detection, Location Tracking, Automated Safety System, Personal Security, Wireless Communication.

AI-BASED HYBRID EV ASSISTIVE SYSTEM FOR FUEL AND ELECTRIC SWITCHING

Ms.R.Savitha[1], Alluri Venkata Satwika[2], Gandavaram Lakshmi Poojitha[3], Gundavaram Abhinaya[4], Jeevitha P[5]

[1]Assistant Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Exploring advancements in hybrid electric vehicle (HEV) technology, this study focuses on optimizing energy management and enhancing automated speed control to improve fuel efficiency, reduce emissions, and ensure safer mobility. Our research introduces an intelligent system that dynamically switches between electric and fuel modes by integrating advanced slope detection techniques, allowing HEVs to adapt to varying terrains and driving conditions seamlessly. Additionally, we propose an RF-based speed control mechanism designed to regulate vehicle speed within designated zones, such as hospitals, schools, and accident-prone areas, thereby enhancing road safety. By leveraging machine learning algorithms and sensor-based detection, the system autonomously responds to diverse driving conditions, optimizing energy consumption and minimizing environmental impact. Despite challenges in integrating real-time terrain analysis and RF-based speed control, advancements in intelligent mobility solutions are expected to overcome these barriers. This study envisions a future where HEVs achieve superior efficiency, reduced emissions, and enhanced safety through the seamless fusion of automated energy management and intelligent speed regulation, driving the evolution of sustainable transportation systems.

Keywords:

Hybrid Electric Vehicles (HEVs), Energy Management System, Fuel Efficiency, Slope Detection, Machine Learning Algorithms, RF-based Speed Control, Regenerative Braking, Sensors and Data Collection, Embedded Systems, Sustainable Transportation.

ADVANCED VEHICLE TO VEHICLE COMMUNICATION SYSTEM USING AI AND COGNITIVE RADIO TECHNOLOGY

Mr. V.PrasathKumar[1], Addanki PoornaVenkataSai[2], Ammireddy Navaneeshwar Reddy[3], Bellamkonda Hemanth[4], Devireddy Ganesh Reddy[5]

[1]Assistant Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

This project focuses on Vehicle-to-Vehicle (V2V) communication using cognitive radio technology to improve road safety and traffic efficiency. By dynamically selecting unused frequency bands, cognitive radio ensures reliable and interference-free communication. The system enables real-time data exchange, including speed, temperature, and proximity, to prevent collisions and enhance situational awareness. A prototype utilizing sensors and simulations demonstrates the feasibility of this approach. The research highlights the potential of cognitive radio in V2V communication and suggests future real-world implementation for intelligent transportation systems. Additionally, cognitive radio technology allows for adaptive spectrum management, reducing congestion in heavily used frequency bands and improving communication reliability in urban and rural environments. The integration of machine learning algorithms can further enhance decision-making, enabling predictive analysis of road conditions and traffic patterns. Future developments may focus on incorporating edge computing to process data locally, reducing latency and enhancing responsiveness. As the demand for intelligent transportation systems grows, cognitive radio-based V2V communication can play a crucial role in creating safer and more efficient road networks. Regulatory policies and standardization efforts will be essential in facilitating widespread adoption. Collaboration between automotive manufacturers, telecommunication providers, and government agencies can accelerate deployment, ensuring compatibility and interoperability across different vehicle models and infrastructure systems

Keywords:

V2V Communication, VANET, Dedicated Short Range Communication (DSRC), Intelligent Transportation Systems (ITS), Platooning, Crash Avoidance System (CAS), Quality of Service (QoS), Real-time Communication, Cooperative Driving, Vehicle-to-Infrastructure (V2I).

FOOT PRESSURE BASED MULTIPLE DISEASE DETECTION SYSTEM

Mrs. R Ashwini[1], Sanjay M[2], Manikanta P[3], Rajkumar P[4], Tejesh R[5]

[1]Assistant Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The proposed system focuses on foot pressure-based disease detection using a KNN (K-Nearest Neighbors) algorithm, which utilizes multiple sensors to gather data. The system incorporates piezosensors to measure foot pressure, an MPU (Motion Processing Unit) to monitor gait movements, and a Flex sensor to measure flex. These sensor data are transmitted via NodeMCU to a laptop, where the KNN algorithm processes the data to predict the likelihood of various foot-related diseases. This non-invasive technique provides a reliable and cost-effective method for early detection of conditions such as diabetic neuropathy, arthritis, and other gait-related disorders. By combining pressure, gait, and flex data, the system aims to offer a comprehensive diagnosis, improving the quality of patient care and enabling timely intervention. The use of KNN allows for an efficient classification based on patterns observed in the sensor data. This work integrates various sensors and machine learning algorithms for real-time disease prediction, contributing significantly to the field of healthcare monitoring.

Keywords:

Foot Pressure, Disease Detection, Prediction, Data classification, Disease monitoring.

HOME AUTOMATION AND SECURITY SYSTEM USING AI AND IOT

Mrs. N. Maragatham[1], J. Mohamed Jassim[2], D.B.Monishwaran[3], D. Mugesh[4], S.Surya[5]

[1]Assistant Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-4] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The Home Automation and Security System using AI and IoT is designed to enhance both security and convenience by integrating smart automation, artificial intelligence, and real-time monitoring. This system leverages IoT-based automation to allow users to remotely control household appliances such as lights, fans, and door locks via a mobile application, improving energy efficiency and ease of use. The incorporation of AI-driven security mechanisms ensures that only authorized individuals can access the home, providing an added layer of protection. By utilizing Arduino, ESP8266 (Wi-Fi module), and automated control systems, the project enables seamless home automation and remote monitoring. Motion-based automation ensures that appliances turn off when not in use, significantly reducing power consumption. Additionally, real-time notifications inform users about security breaches, making the system highly reliable. This project aims to create a scalable and user-friendly smart home solution by integrating mobile app functionality and AI-driven security features. Future enhancements include biometric authentication and AI-based predictive automation to further optimize energy consumption and user experience. By implementing this system, homeowners can achieve greater security, convenience, and cost savings, making smart homes more accessible and efficient.

Keywords:

Esp8266, AI and IoT, Wi-fi module, home automation.

DRIVER DROWISNESS DETECTION AND AUTO VEHICLE CONTROLLING SYSTEM

Ms .A. V. Vishnupriya. M[1], Yaswanth.BV[2], Sumanth DV[3], SaiRaj. K[4]

[1]Assiociate Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-4] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

This project proposes an innovative solution to enhance road safety by developing an automated system for detecting driver drowsiness and health conditions using Python-based webcam technology. By analyzing facial expressions and monitoring fatigue levels through machine learning algorithms, the system can identify signs of drowsiness. Upon detection, a signal is transmitted to a local server, which communicates with a Node MCU device installed in the vehicle. This device initiates safety measures, including reducing vehicle speed, activating hazard lights, and spraying water via a suction motor to awaken the driver. Additionally, a PPG sensor monitors the driver's heart rate, enabling automatic speed adjustments if abnormal patterns suggest potential health issues or discomfort. All data and status updates are logged on the Thing Speak cloud platform, providing real-time monitoring and analysis for comprehensive driver safety management. Ultimately, this integrated approach aims to prevent accidents by proactively addressing driver fatigue and health concerns.

Keywords:

Drowsiness Detection, Driver Fatigue Monitoring, Machine Learning (ML), Computer Vision, Facial Landmark Detection, Eye Blink & Yawning Detection, Head Pose Estimation, Vehicle Control System, Autonomous Emergency Braking (AEB), Lane Departure Warning (LDW), Internet of Things (IoT), Advanced Driver Assistance System (ADAS)

RFID-ENABLED KINETIC ENERGY HARVESTING SYSTEM FOR SUSTAINABLE POWER GENERATION

Dr. A Velayudham [1], Nitish Raj [2], Sanjai K [3], R Sakthivel [4]

[1]Professor and Head, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-4] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The concept of generating electricity from pedestrian movement presents a promising solution for sustainable energy harvesting. This innovative system captures the mechanical force exerted by footsteps and transforms it into usable electrical power, providing an eco-friendly alternative to conventional energy sources. By strategically placing energy-harvesting modules in areas with high foot traffic, the system ensures a continuous and reliable power supply without relying on fossil fuels. To enhance its efficiency, the system incorporates intelligent monitoring and data analysis, allowing it to track movement patterns and optimize energy conversion. By understanding pedestrian flow, it can improve power distribution, predict energy output, and ensure maximum utilization of available resources. This approach not only enhances energy efficiency but also integrates seamlessly into smart city frameworks, contributing to the development of sustainable urban infrastructure. Designed for adaptability, the system can be implemented in a variety of environments, including public spaces, commercial centres, and transportation hubs. Its modular nature allows for easy expansion, making it a scalable solution that can be customized to meet the energy demands of different locations. Additionally, by reducing dependency on traditional electricity grids, this technology supports the transition toward cleaner and more sustainable power sources. As urban centres increasingly prioritize green energy solutions, footstep-based power generation stands out as a practical and innovative approach. By utilizing human movement as a renewable energy source, it fosters environmental sustainability and promotes the integration of smart energy solutions into everyday urban life.

Keywords:

Footstep power generation, Kinetic energy harvesting, Piezoelectric energy conversion, Sustainable energy solutions, Renewable energy harvesting, Smart city infrastructure, Pedestrian movement energy, Eco-friendly power generation, Intelligent energy monitoring, Urban sustainability, Modular energy systems, public space energy solutions, Smart energy technology, Energy-efficient urban planning, clean energy innovation.

SMART DETECTION OF ENERGY THEFT IN AGRICULTURAL SECTORS

Mrs.R Ashwini[1], Kaviga D[2], Rohitha M[3], Sivaranjani G[4], Guru Deepthi V[5]

[1]Assistant Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-4] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The intelligent detection of energy theft focuses on efficient energy resource management through real-time monitoring, anomaly detection, and demand forecasting. Utilizing AC current and voltage sensors, the system tracks energy consumption, timestamps the data, and compiles it into a structured dataset. Future energy demand is predicted using Long Short-Term Memory (LSTM) neural networks, enabling optimized resource allocation. Simultaneously, a Support Vector Machine (SVM) algorithm, trained on historical data, identifies potential theft incidents. The collected data is securely transmitted to the Thing-Speak cloud platform, ensuring accessibility and integrity. A web application is developed to provide users with interactive visualizations of energy consumption, demand forecasts, and theft alerts. This initiative not only enhances energy efficiency but also empowers users with actionable insights to curb energy theft, contributing to sustainability and responsible resource utilization.

Keywords:

Real-time Monitoring, Anomaly Detection, Demand Forecasting, Data Integrity, Smart Energy Management.

AUTOMATED LED ROAD LIGHTING SYSTEM FOR ENHANCED VISIBILITY IN HILLY REGIONS

Dr Pavithra M[1], Balasurya M[2], Gokulakannan S.C[3], Babido Macmillion[4], Jotheesan[5]

[1]Assistant Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-4] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The project suggests an automatic road illumination system employing energy-saving LED strips to facilitate public safety in hilly areas by increasing visibility at dangerous hairpin turns and sharp curves. The system also includes curve sensing and alarm functionalities, employing sensors to activate directional lighting and auditory alerts for impending turns. The method is designed to increase driver alertness, reduce accident chances, and facilitate safer road travel. The four main areas of focus for the project are: Enhanced Road Safety: Greater visibility at critical bends, lessening accident potential in hilly regions. Optimized Lighting: Use of efficient LED strips to provide consistent and reliable lighting. Automatic Control: Sensor-activated system operation as per environmental and road usage parameters. Scalability and Flexibility: Scalable system architecture for installation over different regions and road types. Safety on the road in areas with hilly terrain is jeopardized because visibility is poor on sharp bends and hairpin bends, greatly enhancing the risks of accidents. To take care of this issue, the Automatic Road Lighting System proposed uses an ESP32 microcontroller, voice recording modules, and LED signals. The system has a dynamic response to vehicular movement by lighting the path of travel and providing voice-controlled warnings. A roller-based mechanical system, in conjunction with voltage sensors, tracks vehicle position to trigger directional lighting and audible warnings. This increases driver alertness, minimizes the chances of accidents, and avoids drivers getting lost. Cost-effective, energy-efficient, and easy to deploy, the system provides a scalable solution for improving road safety in hilly and rural areas.

Keywords:

Road Safety, LED Lighting, Hairpin Bends, Curve Detection, Audible Warnings, Energy Efficiency.

SMART HEAD-MOTION CONTROLLED WHEELCHAIR WITH WI-FI FOR QUADRIPLEGICS

Dr Velayudham A[1], Kamesh R[2], Duraisaravanakkumar G[3], Gowtham R A[4], Karthikeyan S[5]

[1]Professor and Head, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-4] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Quadriplegia is the condition of lack of movement in all four limbs. It may or may not render one completely unable to perform certain essential tasks, but it seriously undermines the victim's freedom as well as standard of living. Although quadriplegics learn to live with their situation with the help of adaptive devices, they still have difficulty using regular wheelchairs that require someone who is fit enough to push themselves or operate a joystick. This problem has been solved by introducing the Head Motion Controlled Wheelchair that employs state-of-the-art technology; whereby users can steer the wheelchairs by just moving their heads without having to rely on their hands. The device is made up of motion sensors, a microcontroller unit, transmitters and receivers which facilitate wireless communication thus ensuring stable and efficient performance. In case of any mishap, safety measures like fall detection mechanism with an alert for emergency through mobile application enhance safety and promote quick response. The integration of motion detection technology with wireless communication technology provides a smooth user experience complementing it with additional functionality like accurate data transmission through transmitters as well as receiver. By eliminating physical effort required in steering conventional models, it offers an alternative means of easy movement without such drawbacks inherent in them. The wireless system overcomes wired limitations while the microcontroller chip improves its speed in responding thus making it more adaptable. Head tilt detection provides an intuitive mode of operation that greatly enhances users' quality of life. Far from being just another kind of wheelchair, this model promotes independence, bravery and socializing among its users; it suits quadriplegics and is always available for them to travel safely and comfortably without any risk whatsoever posed by other means of transport.

Keywords:

Head Motion detectors, Quadriplegics, MCUs, Transmitters and Receivers, GPS, Fall Detection.

OTP BASED WIRELESS CHARGING SYSTEM FOR E-VEHICLE ALONG WITH GEO LOCATION SYSTEM

Mr. S M Srihari Shankar[1], Adaka Ravi Teja[2], Billakanti Shreeja Rao[3], Bodduluri Nikilesh [4], Boilla Raghu Vardhan Reddy[5]

[1]Assistant Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-4] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The today's generation Dynamic wireless charging for electric vehicles (EVs) offers a promising solution to enhance charging convenience and reduce range anxiety. This study evaluates the system's performance, efficiency, and safety through rigorous testing and analysis. Results indicate that power transfer efficiency remains high at moderate vehicle speeds but decreases at higher speeds due to misalignment. Environmental factors such as rain and road surface variations have minimal impact, though extreme conditions slightly reduce efficiency. Safety tests confirm compliance with electromagnetic interference (EMI) regulations, and automatic shutdown mechanisms ensure system reliability. User feedback highlights the convenience of continuous charging but raises concerns about installation costs and compatibility. Future improvements focus on enhancing power alignment, weather resilience, and cost-effectiveness to facilitate widespread adoption.

Keywords:

Electric Vehicles, electromagnetic interference, cost, reliability.

MACHINE LEARNING-DRIVEN SYSTEM FOR REAL-TIME AIR QUALITY MONITORING AND PREDICTION

Dr. S. Usha[1], Sadhari Viswateja[2], Vemula Siva Dilip[3], R Subhash Reddy[4]

[1]Associate Professor, Department of AI & DS, Jansons Institute of Technology, Coimbatore, India.

[2-4] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

This project introduces a machine learning-driven system for real-time air quality monitoring and prediction, utilizing MQ-135, MQ-9, and MQ-6 sensors alongside a DHT sensor. The MQ-13 sensor measures the concentration of carbon dioxide (CO2) and ammonia (NH3), the MQ-9 sensor detects methane (CH4) and liquefied petroleum gas (LPG), while the MQ-6 sensor monitors alcohol and carbon monoxide (CO) levels. The DHT sensor provides concurrent temperature and humidity data. This multi-sensor data is collected and transmitted to a machine learning model to compute the Air Quality Index (AQI), which represents the overall air quality. The system aims to deliver accurate, real-time air quality assessments and predictive insights, enabling timely interventions and better environmental management. By combining diverse sensor data with advanced machine learning techniques, this approach enhances the precision and effectiveness of air quality monitoring and prediction. The findings will be shown on the HTML, CSS, and Java script-developed website.

Keywords:

Sensors, LPG, Air Quality Index, HTML, CSS.

ADVANCED ULTRASONIC SMART CANE WITH VOICE ASSISTANCE FOR THE VISUALLY IMPAIRED

Dr Velayudham A[1], Haswanth S S [2], Hariharan P[3], Hariprasath S[4], Dhivakar M[5]

[1] Professor and Head, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The Blind Stick Robot is a high-tech mobility aid designed to enhance movement and safety for visually impaired individuals. Traditional white canes provide only limited tactile feedback and lack the ability to warn users of impending hazards or facilitate communication in emergencies, such as detecting wet floors. With advancements in technology, intelligent devices incorporating sensors and communication modules have been developed to provide comprehensive environmental awareness. This innovation integrates IoT technologies to foster self-reliance and confidence among visually impaired users. At the core of this intelligent stick is the ESP32 microcontroller, which processes input signals and communicates necessary information. It features an ultrasonic sensor (HC-SR04) that utilizes sound waves to detect obstacles, enabling real-time data processing and providing audible cues for navigation, even in unfamiliar areas. Additionally, a water detection sensor identifies slippery surfaces, enhancing safety by alerting users to hazardous environments. A key feature of the Blind Stick Robot is its voice guidance system, which communicates navigation instructions effectively. The inclusion of a GPS module (NEO-6M) and a GSM communication kit (SIM800L) enables location tracking and emergency alerts. In dangerous situations, the stick can send SOS messages or initiate calls to designated contacts, ensuring prompt assistance. These features make it particularly valuable in new or challenging environments. The device is powered by a 12V lithium-ion battery, chosen for its lightweight and durable properties, contributing to energy efficiency. The design incorporates an LM2596S voltage regulator to maintain stable voltage levels across the system, ensuring prolonged operational reliability. By combining these elements, the Blind Stick Robot offers an innovative, reliable, and user-friendly solution for visually impaired individuals, significantly improving their mobility, safety, and independence.

Keywords:

Blind Stick Robot, Mobility Aid, ESP32 Microcontroller, Ultrasonic Sensor, Obstacle Detection, Water Detection, Voice Guidance, GPS Tracking, GSM Communication, Emergency Alerts, IoT Integration, Real-time Processing, Lithium-ion Battery, Voltage Regulation, User Safety, Assistive Technology.

SMART MACHINE FAULT DETECTION SYSTEM USING IOT

Dr.S.Usha[1], Gorla Bhagya Raj[2], Chilaka Yamini Lakshmi[3], Dagada Pavanii[4], Katukuri Vasanth Kumar[5]

[1]Associate Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The loss of one phase of a three-phase Induction Motor (IM) is one of the main causes of motor failure due to overheating. Several protection devices protect IM against this fault, but the majority of conventional devices lack a thorough classification of this type of fault. So, this paper introduces a high-efficiency protection scheme to detect and classify in detail 15 types of faults that can occur due to a phase loss of a three-phase IM. These faults are classified according to the defective phase, fault location either from the power source or beyond the relay point, and motor action modes (standstill mode, transient mode, and steady state mode). One of the advantages of the presented protection method is that it is suitable for many motors because the inputs to the proposed scheme are the per-unit values of both RMS line-line voltages and line currents. The proposed scheme has been validated and tested using MATLAB Simulink under normal conditions and different faults for phase loss, during and after disconnecting the motor, and after pushing the restart button. The simulation results show that the proposed scheme behaves with high efficiency and it is able to detect and classify correctly the phase loss faults for three-phase IM within 1.5 cycles (30 ms) of the fault inception. Thus, the proposed scheme can be used as a simple and reliable scheme in the protection system of a 3-phase IM to detect and classify the different types of phase loss faults.

Keywords:

IoT-based fault detection, Smart machine monitoring, Predictive maintenance, Machine health monitoring, IoT sensors for fault detection.

LUNG MONITORING SYSTEM USING AI

Mrs. R. Savitha[1] , Mucheli Lahari[2], R.SasiKumar[3], S.Sri Sukitha Reddy [4], R.K.ShivaaniSree[5]

[1]Assistant Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The "Lung Monitoring System Using AI" project focuses on continuous health monitoring for individuals with respiratory conditions using advanced sensors and AI technologies. Integrated with an Arduino development board, the system uses various sensors, including gas and temperature sensors, to collect real-time data on lung health. The collected data is processed by machine learning algorithms to detect early signs of respiratory issues, allowing for proactive medical intervention. This system aims to enhance patient care by offering continuous, non-invasive monitoring, reducing hospital visits, and providing timely alerts. The study demonstrates the potential of AI and sensor integration in improving lung health management.

Keywords:

Lung Monitoring, AI, Machine Learning, Arduino, Respiratory Health, Sensors, Continuous Monitoring, Healthcare, Smart Systems, Early Diagnosis.

STRESS BASED VEHICLE SPEED CONTROL USED IOT

Dr.S.Usha[1], Vaishnavi V[2], Pavithra C[3], Madhumitha P[4], Vasavi V[5]

[1]Associate Professor, Department of AI & DS, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Stress-related concerns have become increasingly prevalent in contemporary society, necessitating the development of accurate and non-intrusive detection methods. This paper proposes a multi-modal human stress detection system that integrates facial recognition and emotion analysis to provide a real-time, automated assessment of stress levels. The system employs OpenCV's Haar cascade algorithm for facial detection, followed by stress estimation using a pre-trained Convolutional Neural Network (CNN) model. Additionally, a k-Nearest Neighbors (KNN) algorithm extracts emotional features to enhance the accuracy of stress level classification. By capturing both physiological and emotional cues, the proposed system offers a comprehensive and effective approach to stress monitoring. The integration of deep learning and machine learning techniques enables robust, real-time stress detection, making it applicable across various domains, including workplaces, healthcare, and personal well-being initiatives. The results demonstrate that the system achieves high accuracy in stress classification while ensuring a non-intrusive and user-friendly approach. This study contributes significantly to the field of mental health monitoring by providing a technologically advanced solution for stress assessment and early intervention.

Keywords:

Stress Detection, Open-CV, Haar Cascade Algorithm, Convolutional Neural Network (CNN), Machine learning

AUTOMATION AND SAFETY FOR AGRICULTURE AND FOREST CONSERVATION USING IOT

PrasathKumar V[1], Mohnish S[2], Prakash K[3], Vikram K S K[4]

[1]Assistant Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-4] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Agriculture and forest conservation are increasingly facing challenges due to environmental changes, fire hazards, and inefficient resource management. Traditional monitoring methods rely heavily on manual inspections, which are time-consuming, prone to human error, and ineffective in responding to rapid environmental changes. To address these issues, this paper presents an IoT-based automation and safety system designed to enhance real-time monitoring and disaster prevention in agricultural and forested areas. The proposed system integrates multiple IoT-enabled sensors, including gas, temperature, moisture, and pH sensors, to continuously track environmental parameters and detect anomalies. In the event of abnormal gas emissions or smoke detection, the system automatically triggers alerts to landowners and forest authorities via cloud-based notifications and SMS, enabling timely intervention to prevent disasters such as wildfires and crop damage. Additionally, real-time data visualization through an LCD screen and remote monitoring capabilities via IoT platforms ensure continuous supervision of critical environmental conditions. In agriculture, this system optimizes soil and water management by leveraging automated irrigation based on soil moisture levels, reducing water wastage and improving crop yields. The integration of AI-powered analytics enhances predictive modeling, helping to identify potential risks such as soil degradation, pest infestations, and drought conditions. In forest conservation, the system assists in detecting illegal logging, tracking wildlife movements, and providing early warnings for potential fire outbreaks, contributing to biodiversity protection and ecological balance. By combining automation, IoT connectivity, and intelligent decision-making, this project provides a scalable and efficient solution for ensuring agricultural sustainability and forest preservation. The real-time monitoring and alert mechanisms significantly reduce response time, enhance safety, and improve land management practices. With future enhancements such as drone-based surveillance, AI-driven predictive analytics, and cloud-based data analysis, the system can further revolutionize environmental conservation and precision agriculture.

Keywords:

IoT, automation, smart agriculture, forest conservation, environmental monitoring, wildfire detection, precision farming, smart irrigation, real-time analytics, sustainable resource management.

VOICE CONTROLLED EV SYSTEM AND LOCKING SYSTEM WITH GESTURE BASED AUTHENTICATION

Mrs A Praveena[1], Putala Balanarayana[2], M Ajay[3], M S HariharaSudhan[4], P Johndev[5]

[1]Associate Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-4] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The "Voice Controlled EV System and Locking System with Gesture-Based Authentication" introduces an advanced vehicle security and accessibility solution by integrating voice recognition using Mel-Frequency Cepstral Coefficients (MFCC) and gesture-based authentication via computer vision. This dual-layered system eliminates the need for traditional keys, enhancing both security and convenience by requiring specific voice commands and hand gestures for vehicle access and control. The primary objective is to develop a robust framework that ensures only registered users can unlock and operate the vehicle through authenticated voice and gesture inputs. By merging these technologies, the project creates an intuitive interface while improving system security and reliability. This aligns with the growing demand for smarter, connected vehicles, making it a timely innovation in the automotive sector. The methodology combines expertise in electrical engineering, computer science, signal processing, and motor control systems. The voice recognition module leverages MFCC for accurate speech feature extraction, while the gesture authentication system uses image processing and machine learning for reliable hand movement detection. These subsystems are integrated with a microcontroller-driven motor system that executes validated commands. The project follows a systematic development process, including standalone module creation, integration, and real-world testing to ensure efficiency and reliability. By replacing conventional access mechanisms with voice and gesture controls, this innovation enhances user experience, addresses modern security challenges, and sets a new benchmark for intuitive vehicle interaction.

Keywords:

Voice Recognition, Gesture-Based Authentication, Mel-Frequency Cepstral Coefficients (MFCC), Computer Vision, Electric Vehicle (EV) Security, Biometric Authentication, Smart Vehicle Access, Signal Processing, Machine Learning, Human-Vehicle Interaction.

WILD ANIMAL MOVEMENT DETECTION AND ALERT SYSTEM

Dr.A. Praveena[1], M Sai Maruthi Kalyan[2], Mahid Basha Syed [3], N Venkata Sai Nikhil Chowdary[4], P Likith Srikanth[5]

[1]Associate Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The "Wild Animal Movement Detection and Alert System" is designed to monitor and detect wildlife activity in real-time using an ESP32-CAM integrated with the YOLO (You Only Look Once) object detection algorithm. This system enables effective tracking of wild animals in their natural habitats, providing critical data for conservation efforts and research. The ESP32-CAM captures live video feeds, which are processed through YOLO to identify and classify animal movements. When animals are detected, alerts are generated and sent to designated users via a mobile application or web interface. This project aims to enhance wildlife monitoring, mitigate human-wildlife conflicts, and contribute to biodiversity conservation by providing actionable insights into animal behavior.

Keywords:

Wildlife Monitoring, Object Detection, ESP32-CAM, YOLO Algorithm, Human-Wildlife Conflict.

DEVELOPMENT OF SEMI-AUTONOMOUS DRONE SYSTEMS FOR EFFICIENT DELIVERY OF MEDICAL SUPPLIES IN REMOTE AND DISASTER AREAS

Mrs. A. Praveena[1], Allwin Suresh[2], S. Ajay Kumar[3], Guna.M[4], Guruprasath.K[5]

[1]Associate Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The work focuses on designing an advanced drone system capable of delivering medical supplies to inaccessible or disaster-stricken regions with precision and efficiency. This innovative system leverages a combination of cutting-edge technologies to ensure safe and reliable operations. Equipped with an ESP32 Camera, the drone provides real-time video streaming and monitoring to assist in navigation and environmental assessment. To enhance its capabilities, the system integrates advanced artificial intelligence techniques, including YOLO (You Only Look Once) object detection for identifying obstacles, landmarks, and delivery zones with high accuracy, a Convolutional Neural Network (CNN) for detecting fire hazards to ensure safe navigation, and Media pipe-based human activity detection to recognize gestures or movements, enabling interaction with individuals in need and identifying safe zones for package drops. Furthermore, the system incorporates IoT integration for remote monitoring and control, allowing real-time tracking of the drone's status, location, and operational parameters through a cloud-based platform, ensuring operational efficiency and accountability. This project presents the design and implementation of a semi-autonomous drone system, which incorporates a range of advanced technologies to enhance its operational capabilities. The system integrates a display for real-time data, a GSM module for remote communication, and a GPS module for navigation. A key feature of this project is the integration of a human identification system using wireless cameras and image processing techniques, allowing the drone to detect and identify individuals within its operational area. This Semi-autonomous drone system addresses critical challenges in disaster response by delivering life-saving medical supplies, identifying survivors, and avoiding hazardous conditions, thus offering a robust solution to revolutionize healthcare logistics and emergency management in remote and disaster-prone areas. Through the integration of artificial intelligence, computer vision, and IoT technologies, this project has the potential to transform the way medical aid is provided in critical situations, contributing significantly to improving healthcare accessibility and disaster relief efforts.

Keywords:

ESP32, YOLO, CNN, IoT, Disaster prone areas

SMART WEARABLE FOR DETECTING DEHYDRATION

Mrs. N. Maragatham[1], B. Manoj Kumar[2], CH.V. Nihan Royal[3], J. Pavan Kumar[4], K. Venkatesh[5]

[1]Assistant Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Dehydration is a critical health concern affecting individuals across various demographics, from athletes to the elderly, often leading to severe complications like heatstroke, kidney damage, and chronic fatigue. Traditional hydration monitoring methods, such as manual tracking or periodic medical tests, fail to provide real-time insights, making them ineffective in preventing dehydration. This project proposes a smart wearable device that integrates multiple sensors—GSR, pH, DHT11, and PPG—to continuously monitor hydration levels with high accuracy. The collected data is processed using a Node MCU microcontroller and transmitted to a cloud-based platform, where machine learning algorithms analyze hydration patterns and issue real-time alerts. By leveraging advanced sensor technology and cloud analytics, this innovative solution ensures proactive hydration management, enhancing personal health monitoring and preventing dehydration-related risks.

Keywords:

Dehydration Monitoring, Smart Wearable, Machine Learning, Sensor Technology, Health Monitoring.

MULTIPLE DISEASE DETECTION SYSTEM USING SWEAT ANALYSIS

Mrs.R Ashwini , Arshika G[2], Arulkumar R[3], Chendhi Divya [4], Dharanidharan S[5]

[1]Assistant Professor, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Computer Science and Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The real-time health monitoring system that utilizes biomarkers and Machine Learning (ML) techniques for continuous disease prediction and preventive healthcare. The system integrates non-invasive sensors and embedded processing to measure key health parameters, including temperature, humidity, blood pressure (diastolic), oxygen saturation (SpO2), heart rate (BPM), and pH levels, enabling continuous physiological assessment. A microcontroller with edge-processing capabilities is employed to analyze real-time sensor data using the K-Nearest Neighbor (KNN) algorithm, classifying health conditions based on biomarker variations. The implementation focuses on optimizing ML models for low-power embedded devices, ensuring a balance between computational efficiency and predictive accuracy in disease detection. A web-based dashboard provides real-time health visualization, enabling users to monitor their health status effectively. Proactive health tracking plays a crucial role in early disease prevention, empowering individuals to take charge of their well-being through continuous, data-driven insights. Keywords: Sweat Analysis, Disease Prediction, Machine Learning, Non-Invasive Monitoring, Edge Computing.

Keywords:

Sweat Analysis, Disease Prediction, Machine Learning, Non-Invasive Monitoring, Edge Computing.

DEEP LEARNING-BASED AUTONOMOUS PREDICTIVE CARE IN INTELLIGENT TRANSPORTATION SYSTEMS

Jansirani S[1], Sruthi Sree S G[2], Sneha C[3], Suwetha S[4], Shifana Begum[5]

[1]Assistant Professor, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

.

Abstract:

Modern transportation systems depend on sensor networks to monitor critical vehicle parameters such as pressure, temperature, and acceleration. In Intelligent Transportation Systems (ITS), accurate sensor data is essential for vehicle diagnostics, traffic management, and safety. However, faulty sensors, particularly NSPAS3 manifold absolute pressure (MAP) sensors, can produce incorrect readings, leading to performance issues and increased accident risks. This study proposes a fault detection framework using deep learning techniques to analyze sensor behavior and identify failures. A sequential model incorporating Long Short-Term Memory (LSTM) networks is employed to capture temporal dependencies in sensor data, improving fault classification accuracy. Additionally, Conditional Tabular GAN (CTGAN) is used to generate synthetic data, simulating real-world sensor conditions, including normal and faulty states. By integrating advanced deep learning with synthetic data generation, the proposed system enhances fault detection capabilities, enabling timely maintenance and improving vehicle reliability in ITS.

Keywords:

Fault detection, NSPAS3 sensor, LSTM, Deep Learning, CTGAN, Intelligent Transportation Systems, and Vehicle Diagnostics

A SELF-DIAGNOSIS MEDICAL CHATBOT

Jansirani S[1], K Pavankumar[2], M Siddu Vinay[3], B Mohan Rao[4], M Bharath[5]

[1]Assistant Professor, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

Abstract:

With the increasing demand for quick and accessible healthcare insights, AI-driven chatbots have emerged as a promising solution for preliminary health assessments. This work presents an AI-powered **self-diagnosis medical chatbot** that leverages **LLaMA 3 70B for conversational AI** and **LLaMA 3 Vision for medical image analysis** to assist users in understanding their health conditions. The system integrates **Hugging Face Transformers** for text processing, **BERT** for summarizing medical information, and **Scikit-learn** for personalized health recommendations. Additionally, it supports **multilingual communication** via **Google's Deep Translator** and enables **voice-based interaction** using **Google Speech-to-Text API and gTTS**. To enhance its functionality, the chatbot processes **medical reports** using **ReportLab**, extracting relevant insights from PDFs. The front-end, developed with **Streamlit, HTML, and CSS**, ensures a seamless and interactive user experience. This research explores the chatbot's potential in improving healthcare accessibility and highlights its impact on enhancing user engagement through AI-powered assistance.

Keywords:

LLaMA 3.3 70B, LLaMA 3.2 Vision, Hugging Face Transformers, BERT, Google Deep Translator, Google Speech-to-Text API, gTTS (Google Text-to-Speech), ReportLab, Scikit-learn, Streamlit, HTML, CSS.

SMART TRAFFIC SIGNAL SYSTEM FOR EMERGENCY VEHICLE CLEARENCE USING AI AND IoT

Ramya M[1], B Hemanth Raj[2], G.Jignesh[3], K. Gnanesh Reddy[4], V. Niranjan Kumar[5]

[1]Assistant Professor, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Traffic congestion in urban areas poses a significant challenge for emergency vehicles such as ambulances and fire trucks. Delays in reaching the destination can have life-threatening consequences. This project develops a Smart Traffic Signal System to prioritize emergency vehicles by detecting them in real-time and adjusting traffic signals accordingly. The system integrates AI-based sound classification with IoT-driven traffic control to optimize traffic flow and ensure a smooth passage for emergency vehicles. In today's urban environments, increasing traffic congestion causes delays for emergency vehicles, potentially leading to life-threatening situations. This project aims to implement an AI and IoT-based Smart Traffic Signal System that detects emergency vehicles and dynamically adjusts traffic signals to prioritize their movement. The system leverages advanced sound processing techniques and machine learning algorithms to recognize emergency sirens and make intelligent traffic control decisions. Emergency vehicle detection is achieved using Mel Frequency Cepstral Coefficients (MFCC) to extract features from siren sounds, Spectrogram analysis to convert sound data into visual representations, and a Support Vector Machine (SVM) model to classify emergency vehicle sounds from ambient noise. For traffic signal control, a Raspberry Pi is used as the central processing unit to analyze detected emergency vehicles, and General-Purpose Input/Output (GPIO) pins are utilized to control traffic light signals based on detection results. The system successfully detects emergency sirens with high accuracy using MFCCs and spectrogram analysis combined with SVM. Upon detection, the Raspberry Pi controls traffic signals via GPIO to provide an uninterrupted path for the emergency vehicle. This ensures efficient traffic management and significantly reduces emergency response time. The Smart Traffic Signal System for Emergency Vehicle Clearance integrates AI-based sound classification with IoT-driven traffic control. By leveraging machine learning models like SVM and using Raspberry Pi for real-time traffic light management, the system ensures a smoother and safer passage for emergency vehicles. Future enhancements may include integrating GPS-based tracking for more precise vehicle location detection and adaptive traffic signal optimization.

Keywords:

Traffic congestion, emergency vehicle detection, AI, IoT, MFCC, Spectrogram, SVM, Raspberry Pi, GPIO, traffic signal control

AIR QUALITY MONITORING SYSTEM IN A CAR USING ML

Dr. S.Elangovan[1], A.Tharun[2], B. kushyanth Reddy[3], CH .M Dinesh[4], M. Saraschandra Reddy[5]

[1]Professor, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

Abstract:

In today's urban settings, most vehicles remain idle for long periods due to traffic congestion and changing travel behaviors. Extended idleness of cars can lead to the accumulation of hazardous gases inside the vehicle, such as Compressed Natural Gas (CNG) in CNG-powered cars, Carbon Monoxide (CO) in petroleum-fueled vehicles, and Carbon Dioxide (CO_2) from both fuel combustion and human respiration. These gases pose significant risks, including fire hazards and health complications, when the vehicle is started without prior ventilation. This project develops a Machine Learning-based Air Quality Monitoring System to determine whether the air inside a vehicle is safe for use. The system leverages a Random Forest algorithm to analyze gas concentration levels and environmental conditions. The model is trained on datasets containing various gas presence, allowing it to classify air quality as normal or abnormal with high accuracy. By forecasting potential gas accumulation risks, this system enhances vehicle safety and prevents accidents caused by undetected leaks or exposure to toxic air. The approach is purely software-based, making it adaptable for integration into existing vehicle monitoring systems or mobile applications for user-friendly alerts. Future improvements may include deep learning enhancements and predictive analytics for even more precise air quality assessments.

Keywords:

Air Quality Monitoring, Machine Learning, Vehicle Safety, Gas Concentration, Random Forest Algorithm.

EARLY DETECTION OF DIABETES

Mrs. M.S. Krishna Priya[1], Kinnera Vamsi Vardhan[2], Pullurwar Sachin[3], Parava Charan Reddy[4], Yenugula Naga Sai Sathwik[5]

[1]Assistant Professor, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The majority of individuals in today's generation suffer from diabetes, a global disease that is very harmful to human health. Individuals in a country like India would become aware of it when they started exhibiting particular symptoms. Consequently, early diabetes detection is far more crucial. As a result, there is only one way to diagnose diabetes. In other words, measuring blood sugar levels will reveal whether or not a person has blood sugar problems. The suggested remedy was early diabetes detection includes pressure, temperature, and humidity measurements. In the proposed solution DHT 11 sensor uses the user's index finger to monitor temperature and humidity, while the PIEZOELECTRIC sensor uses the user's foot to measure pressure. After processing and transferring the data to the cloud, a logistic regression model that incorporates independent variables that accurately predict a person's level of diabetes is used to assess if the person is healthy or at risk of getting the condition. The findings will be shown on the HTML, CSS, and Java script-developed website.

Keywords:

Early Diabetes Detection, Pressure and Temperature Sensors, Cloud-based Health Monitoring, Logistic Regression, Health Risk Prediction.

AI-POWERED RAILSAFEBOT

Dr. Elangovan[1], KM.Yehaasary[2], A. Deepak[3], N. Dharanidharan[4], C. Kaartikeyan[5]

[1]Professor, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Railway transportation is one of the most cost-effective and efficient means of transport. However, safety concerns due to undetected track cracks pose a significant threat to passenger security and infrastructure longevity. Traditional methods of manual inspection are time-consuming, prone to errors, and inefficient, leading to delayed maintenance actions and increased operational risks. This paper presents an AI-powered Railsafebot, a robotic system integrated with a camera module and Canny Edge Detection for railway track crack detection. The proposed system captures high-resolution images of railway tracks and processes them using the Canny Edge Detection algorithm to identify potential cracks with high accuracy. By leveraging edge detection techniques, Railsafebot enhances crack detection precision and minimizes false positives, ensuring reliable track monitoring and alert the officials. The system's architecture integrates a real-time image processing module that enables track crack analysis, reducing dependency on external computing resources. Additionally, the implementation of Canny Edge Detection allows for efficient and cost-effective identification of structural anomalies in railway tracks, facilitating timely maintenance interventions. This paper discusses the system's methodology, software-hardware integration, and effectiveness. It demonstrates how AI-enabled railway crack detection using a camera module and Canny Edge Detection significantly enhances railway safety, operational efficiency, and maintenance planning, contributing to a more robust transportation infrastructure.

Keywords:

AI-Powered Crack Detection, Railway Track Monitoring, Canny Edge Detection, Automated Maintenance, Robotic Safety System.

CLEANO – SMART DUSTBIN MANAGEMENT SYSTEM

Prof. M Ramya[1], Shinde Vaibhav[2], Kisshore N[3], Amara Chidvi Sri Sanjana[4], B Himanth[5]

[1]Assistant Professor, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Effective waste management is a critical challenge in urban areas, where improper disposal and inefficient recycling contribute to environmental degradation. Traditional waste disposal systems rely on manual sorting, which is time-consuming, labor-intensive, and prone to errors. The lack of automation in waste classification leads to improper segregation, reducing recycling efficiency and increasing landfill waste. This research proposes a Smart Dustbin Management System that leverages artificial intelligence (AI), computer vision, and barcode scanning to automate waste classification and optimize waste collection. The proposed system integrates AI-based object detection models, such as YOLO and MobileNet, to identify and categorize waste into predefined classifications, such as plastic, paper, metal, and organic , Additionally, barcode scanning technology enhances classification accuracy by retrieving product details and material composition from a centralized database. By automating waste sorting at the source, the system minimizes human intervention, improves recycling efficiency, and promotes sustainable waste disposal practices. A key challenge in waste management is the lack of user awareness regarding proper waste segregation. Many individuals dispose of recyclable and non-recyclable waste together, contaminating recyclable materials and reducing processing efficiency. To address this issue, the system incorporates a digital reward mechanism that incentivizes users for correct waste disposal. This feature encourages responsible behavior and increases public participation in sustainable waste management. Existing smart waste management solutions primarily focus on monitoring waste levels using IoT sensors, but they often lack classification capabilities. This limitation results in mixed waste collection, making recycling difficult and inefficient. The proposed system overcomes this drawback by incorporating real-time object detection and barcode scanning, ensuring accurate segregation before waste collection, The system continuously collects and analyzes data on waste disposal behaviors, allowing municipalities to plan efficient collection routes, allocate resources effectively, and reduce fuel consumption in waste collection vehicles. This approach contributes to both economic and environmental sustainability. Security and scalability are essential factors in implementing the smart dustbin system. The system employs encrypted data transmission to protect user information, ensuring secure storage and processing of waste classification data. Additionally, the modular architecture allows scalability for future enhancements,

including IoT-enabled smart bins and blockchain-based reward tracking for transparency and reliability. Field testing of the Smart Dustbin Management System demonstrates significant improvements in waste classification accuracy, recycling efficiency, and user engagement. Initial results indicate a reduction in mixed waste disposal, increased participation in responsible waste management, and a positive impact on urban sanitation. These findings support the system's potential as a scalable solution for modern waste management challenges. Future enhancements may include the integration of IoT sensors for real-time bin monitoring and a mobile application for wider accessibility. The Smart Dustbin Management System aligns with sustainable development goals by promoting responsible waste disposal, reducing landfill accumulation, and enhancing recycling efficiency. By leveraging AI, computer vision, and data analytics, the system contributes to the development of smart cities with sustainable and eco-friendly waste management practices.

Keywords:

Dustbin,Yolo, Cnn, Realtime Monitoring, AI, sklearn, Ml, Streamlit ,Iot, Arduino, Proximity sensor, servo motor, garbage data set

CROP AND SOIL HEALTH PREDICTION FOR SUSTAINABLE AGRICULTURE

R Esther Priya[1], P Yuva Venkat[2], M Rajasekhar Reddy[3], K Sasikala4, K Hareesh[5]

[1]Assistant Professor, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Farmers are the backbone of many nations, yet they confront many difficulties, such as pests, water scarcity, and unpredictable weather. They face financial challenges that limit sustainability and productivity, and they frequently rely on traditional knowledge. To solve these problems, we have created an approach for determining the best crop for farms by analyzing data in real time and predicting crops using machine learning techniques, particularly the K-Nearest Neighbors (KNN) model. The system determines the best crop option by analyzing variables like temperature and humidity (DHT11), soil pH (using an Analog pH Sensor Kit), soil moisture (FC-28) and air quality (MQ-135). We can estimate the soil health using the same sensorsThe sensors are connected to a NodeMCU to collect environmental data in real time, which is then wirelessly transmitted to a local host. This approach promotes efficient land use, lowers resource waste, improves economic stability, raises agricultural yields, and guarantees sustainable farming practices. Additionally, by conserving water, lowering fertilizer use, and decreasing pest losses, it promotes long-term agricultural sustainability and flexibility to future difficulties.

Keywords:

Temperature and Humidity Sensors: DHT11or DHT22, Soil pH Sensor: Analog pH Sensor Kit, Soil Moisture Sensors: YL-69, FC-28; Air Quality Sensors: MQ-x Series, MQ-135 or MQ-2, Machine Learning Model, K-Nearest Neighbors (KNN), Wireless Module: NodeMCU.

AI – POWERED AGRICULTURAL DAMAGE ASSESSMENT SYSTEM

Mrs. M. S. Krishna Priya[1], Vishal RK[2], Kota Shanmugam[3], Uppala Shiva[4], Sanjeevi P[5]

[1]Assistant Professor, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Agriculture is undergoing a significant transformation with the integration of Artificial Intelligence (AI), enhancing efficiency, precision, and sustainability. Traditionally, manual surveys have been used for crop monitoring and assessment, but AI-driven techniques are now revolutionizing these processes. This research explores AI-driven techniques in agriculture, focusing on automated monitoring, crop health assessment, and report generation. AI-powered models, such as deep learning and computer vision, analyse the drone imagery to detect affected crops. In this work, we apply machine learning algorithms like CNN and image processing techniques that enable predictive analytics and utilize YOLO models, reducing the human intervention and improves the decision-making process. AI systems assess the impact of natural disasters by identifying affected and unaffected crops, enabling the accurate calculation of losses and generating subsidy recommendations for affected farmers. Furthermore, the AI-based automated report generation systems that have been used here, compile real-time insights into structured reports, providing farmers with actionable recommendations. The proposed method also evaluates various AI frameworks and their effectiveness in generating accurate, timely, and user-friendly agricultural reports. By integrating AI-driven analytics with digital reporting, this research aims to enhance precision farming practices, optimize resource utilization, and improve overall agricultural productivity.

Keywords:

AI in Agriculture, Crop Health Assessment, Drone Imagery, Machine Learning, Automated Report Generation.

PETITION FLOW-AN AI POWERED PATH TO RESOLUTION

Prof. M S Krishna Priya [1], Kishore S A[2], Sowndharyan S J[3], Eeswaran H[4], Jeshwanth A[5]

[1]Assistant Professor, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The AI-Powered Petition Analysis and Grievance Management System revolutionizes traditional grievance redressal by integrating Artificial Intelligence (AI) and Machine Learning (ML) to automate petition classification, detect urgency, and enable voice-based submissions. Conventional grievance handling methods are manual, slow, and lack prioritization mechanisms, often delaying critical complaint resolutions. In this system addresses these limitations by automatically classifying petitions into predefined categories using Logistic Regression and Natural Language Processing (NLP), identifying high-risk, time-sensitive complaints through AI-powered priority classifiers trained on historical data, and enabling speech-to-text integration to convert voice-based petitions into structured text for improved accessibility, particularly for visually impaired and illiterate users. Additionally, it automates complaint assignment and tracking, ensuring faster resolutions with real-time monitoring. Built using Python, Streamlit, and AI processing libraries, the system leverages TF-IDF for text analysis and speech recognition for voice complaints. By enhancing efficiency, transparency, and accessibility, this solution streamlines grievance redressal, ensuring faster response times and equitable handling of public concerns. Future enhancements include multilingual voice support, mobile app development, and blockchain integration for secure complaint tracking. This AI-driven system marks a significant step toward modernizing governance, enabling faster, more transparent, and citizen-friendly grievance redressal mechanisms.

Keywords:

AI Grievance Management, Petition Classification, Voice-Based Submissions, Natural Language Processing, Complaint Automation.

ENHANCED SKIN CANCER DETECTION THROUGH ADVANCED HAIR SEGMENTATION AND REMOVAL TECHNIQUES

Mrs. T.Ramya[1], Ms.A.Benaseer[2], I. Sneha Sandhya[3], K.Poojitha[4], I.S.Anisha[5], T.Aishwarya[6]

[1]Assistant Professor, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

[2-6] UG Students, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Dermoscopic imaging is crucial for diagnosing and monitoring skin conditions in dermatology. However, hair artifacts often hinder accurate analysis, necessitating their segmentation and removal as preprocessing steps. In this study, we propose a novel approach employing U-Net architecture for hair segmentation and removal in dermoscopic images, combining traditional image processing techniques with deep learning. Initially, we use thresholding, edge detection, and morphological operations to localize hair regions in dermoscopic images. Subsequently, a U-Net model is utilized to classify these regions as hair or non-hair, trained on a large annotated dataset to distinguish between hair and skin features effectively. Upon identification of hair regions, inpainting algorithms are applied to seamlessly remove detected hair artifacts while preserving underlying skin texture and structures, guided by surrounding skin pixels for natural-looking results. We evaluate our method on a diverse dataset, comparing it with existing techniques for hair segmentation and removal using quantitative metrics like precision, recall, and F1- score to assess hair removal accuracy and skin feature preservation. Experimental results demonstrate the effectiveness and robustness of our proposed approach in accurately segmenting and removing hair artifacts from dermoscopic images.

Keywords:

Hair Segmentation, Dermoscopic Imaging, U-Net Architecture, Deep Learning, Skin Condition Diagnosis.

NON-INTRUSIVE DETECTION OF JAUNDICE IN NEONATAL USING DEEP LEARNING ALGORITHM

Mrs.Ramya T[1], BinduBhavya G[2], Kevin K[3], Nithishwaran NB[4], Sarvetha S[5]

[1]Assistant Professor, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Neonatal jaundice is a common condition in newborns that, if left undetected, can lead to serious health complications. This study introduces a non-invasive jaundice detection system powered by machine learning to assist in early diagnosis. Our approach focuses on analyzing neonatal images, applying the Histogram of Oriented Gradients (HOG) algorithm to highlight the forehead region, ensuring precise feature extraction. We then analyze RGB and YCbCr color values, which help identify subtle skin tone variations associated with jaundice. A Convolutional Neural Network (CNN) processes these features to determine whether an infant shows signs of jaundice. By combining advanced feature extraction and deep learning, our method offers an accurate, efficient, and cost-effective solution for screening jaundice.

Keywords:

Neonatal Jaundice Detection, Machine Learning, Convolutional Neural Network (CNN), Non-Invasive Screening, Feature Extraction.

REAL-TIME TEMPERATURE MONITORING AND DISEASE PREDICTION IN POULTRY FARMS

Mrs. T Ramya[1], Deepakraj R[2], Ramsurya B[3], Surendranath P[4]

[1]Assistant Professor, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

[2-4] UG Students, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Poultry farming requires continuous temperature monitoring to ensure bird health and optimal growth conditions. This research introduces a real-time temperature monitoring system for poultry farms, enabling farmers to track environmental conditions efficiently. Sensors placed throughout the farm provide live temperature data, ensuring a stable climate to reduce stress on the poultry. Additionally, a Convolutional Neural Network (CNN) model analyzes poultry stool images for early disease detection, enabling timely intervention. By leveraging deep learning techniques, the system can accurately identify patterns in fecal matter, helping farmers detect potential diseases before they spread. The integrated system automates monitoring and disease prediction, improving farm efficiency and reducing manual inspections. A user-friendly dashboard presents real-time analytics and alerts, allowing farmers to take immediate action when temperature fluctuations or disease symptoms are detected. The modular architecture allows for future IoT integration, cloud storage for historical data analysis, and expansion to detect a wider range of poultry diseases. Initial testing shows improved poultry health, reduced mortality rates, and optimized farm productivity. By combining real-time monitoring with AI-driven analysis, this system offers a scalable and cost-effective solution for modern poultry farming.

Keywords:

Poultry Farming, CNN, Real-time Monitoring, AI, Machine Learning, Temperature Monitoring, Disease Prediction, IoT, Smart Agriculture.

REWARD BASED TRAFFIC COMPLIANCE SYSTEM

Ms.R.Esther Priya[1], Ms.A.Benaseer[2], K. Steve Jino[3], M. Kiruthika[4], S.Madhan[5]

[1]Assistant Professor, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Ensuring road safety is a critical challenge, with traffic violations leading to a significant number of accidents and fatalities worldwide. Traditional enforcement mechanisms rely heavily on penalties and fines, often resulting in public dissatisfaction and limited long-term behavioral change. To address this issue, we propose a Reward-Based Traffic Compliance System, which leverages Artificial Intelligence (AI), real-time data analytics to monitor traffic compliance and incentivize responsible driving behaviors. This system detects adherence to traffic rules—such as wearing helmets and obeying speed limits—using AI-powered cameras and sensors. Drivers who consistently follow regulations earn reward points, which can be redeemed for tangible benefits such as fuel discounts, insurance cashback, public transport incentives, and retail vouchers. The system integrates a gamification model, including leader boards and achievement badges, to enhance engagement and motivate compliance. The expected outcomes of this initiative include a reduction in traffic violations and accidents, increased public participation in compliance programs, and improved trust in law enforcement agencies. The system has significant potential for integration into smart city infrastructure and insurance policies, ultimately contributing to safer roads and enhanced traffic management.

Keywords:

AI-Powered Traffic Compliance, Reward-Based Enforcement, Smart Road Safety, Gamification in Traffic Management, Real-Time Traffic Monitoring.

AI-POWERED CAREER AND SKILL RECOMMENDATION SYSTEM

Dr. Elangovan[1], Aswin.S[2], Dharnessh.S[3], Safir Ahamed. M[4], Shanmugakumar.L[5]

[1]Professor, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

Abstract:

In today's competitive job market, individuals often struggle to align their skills with the requirements of their desired job roles, leading to missed opportunities and prolonged career growth. To address this challenge, we propose an AI-Powered Career and Skill Recommendation System that evaluates a user's readiness for specific job roles and provides actionable recommendations to bridge skill gaps. The system takes two primary inputs—the user's resume and a job description—and uses advanced AI techniques to extract and compare key skills, qualifications, and experience. It calculates a match percentage to quantify the alignment between the user's profile and the job requirements, while also identifying skill gaps where the user lacks necessary qualifications. Based on this analysis, the system recommends personalized course content and skill development programs to help users achieve their career aspirations. Designed to be user-friendly and scalable, the system empowers individuals to take control of their career development by providing clear insights and actionable steps. Future enhancements may include real-time job market trend analysis and integration with online learning platforms for seamless skill development.

Keywords:

AI-Powered Career Guidance, Skill Recommendation System, Resume Analysis, Job Matching, Skill Gap Identification, AI in Recruitment, Personalized Learning, Career Development, Job Market Trends, Machine Learning, Online Learning Integration, Employment Readiness, Talent Optimization, Professional Growth, Automated Job Fit Assessment.

AUTOMATED NAVIGATION FOR UAV SIMULATION

Ms. R Esther Priya[1], P Aabheshek[2], T N Arun[3], Garrepelli Varshini[4], S Sasikumar[5]

[1]Assistant Professor, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Artificial Intelligence and Data Science, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The rapid advancement of drone technology has sparked significant interest in the development of autonomous navigation systems. This project focuses on creating a robust model designed to enable unmanned aerial vehicles (UAVs) to operate independently in dynamic environments. By leveraging advanced algorithms for real-time decision-making, path planning, and obstacle detection, this allows UAVs to navigate without human intervention. Utilizing Deep Reinforcement Learning (DRL), specifically the Soft Actor-Critic (SAC) model, and YOLOv8 for obstacle detection, the system is designed to learn and adapt in real-time while avoiding both static and dynamic obstacles. The project employs the Air Sim simulation platform to train models in various simulated environments, ensuring adaptability and robustness. Key outcomes include efficient collision avoidance, adaptive learning across diverse terrains, and improved navigation performance compared to traditional methods. Future developments aim to implement the model on real drones and enhance system capabilities with multi-agent navigation and improved motion prediction.

Keywords:

Autonomous Drone Navigation, Unmanned Aerial Vehicles (UAVs), Deep Reinforcement Learning (DRL), Soft Actor-Critic (SAC), YOLOv8, Obstacle Detection, Path Planning, Collision Avoidance, AirSim Simulation, Adaptive Learning, Real-Time Decision Making, Multi-Agent Navigation, Motion Prediction, AI-Powered UAVs, Robotics and AI.

INTEGRATED IOT SOLUTION FOR CONTINUOUS PATIENT VITAL SIGN MONITORING AND ALERTING

Dr.K. Mahendran[1], Nagi Reddy Induvardhan Reddy[2], Pachipulusu Subramanya Sreenivasan[3], Talari Charmi Shreya[4], P.Preem[5]

[1]Associate Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

With the rise in global life expectancy and advancements in technology, creating age-friendly environments has become a priority in designing healthcare products for the elderly. This paper proposes a real-time health monitoring system for older adults residing in geriatric facilities. The system aims to assist caregivers in effectively monitoring their patients' health while maintaining close communication with their families. To assess the feasibility and effectiveness of this approach, a prototype was developed featuring a biometric bracelet connected to a mobile application. This setup enables real-time visualization of key health metrics, including heart rate, body temperature, and blood oxygen levels. By analyzing this data, caregivers can make informed decisions about their patients' well-being. User evaluations indicated that the system is easy to learn and use, providing initial evidence that it could enhance the quality of healthcare for older adults.

Keywords:

Real-time health monitoring, Elderly care, Biometric bracelet, Geriatric facilities, IoT healthcare system

VEHICLE TO VEHICLE COMMUNICATION USING LI-FI TECHNOLOGY

Dr.K. Mahendran[1], A.Rama Sai Tejaswini[2], G. Pruthivi Raj[3], B.Amarnadh[4], B. Vishwanath[5]

[1]Associate Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Vehicle-to-Vehicle (V2V) communication is a crucial advancement in intelligent transportation systems, significantly enhancing road safety and traffic efficiency. This project proposes a bidirectional V2V communication system leveraging Li-Fi (Light Fidelity) technology integrated with an ESP32 microcontroller to establish high-speed, reliable, and energy-efficient data transmission between vehicles.The system incorporates multiple sensors and modules to enhance data accuracy and situational awareness. Ultrasonic sensors detect nearby obstacles and measure vehicle proximity, while MEMS (Micro-Electro-Mechanical Systems) sensors provide real-time motion and acceleration data to identify sudden changes in movement patterns. Additionally, U-slot speed sensors track vehicle speed, and a brake switch detects braking actions to enable prompt warning alerts to nearby vehicles.Unlike conventional RF-based V2V communication systems, Li-Fi offers higher data transmission rates, lower latency, and reduced interference from external radio signals. This makes it a more secure and efficient alternative, especially in environments where RF congestion is a concern. Furthermore, the integration of IoT (Internet of Things) technology allows real-time data logging and remote monitoring, enabling traffic management systems and authorities to analyze vehicular movement patterns, detect anomalies, and improve overall road safety.

Keywords:

Vehicle-to-Vehicle (V2V) Communication, Li-Fi Technology, ESP32 Microcontroller, Intelligent Transportation System (ITS), Sensor-Based Data Acquisition, Internet of Things (IoT) Integration

EARLY WARNING SYSTEM FOR GLACIAL LAKE OUTBURST FLOOD

Dr.N.Krishnapriya[1], P.Dhanasri[2], Gaddam Jayanth Babu[3] Jonnadula Vinay Kumar[4], S.Kannan[5]

[1]Associate Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The development of an IoT-based Early Warning System for Glacial Lake Outburst Floods (GLOFs) aims to monitor environmental conditions in real-time, enhancing disaster preparedness and risk mitigation. This system leverages key technologies, including the ESP32 microcontroller, vibration sensors, water level sensors (JSN SR04T), temperature sensors (DHT22), tilt sensors (ADXL345), and a GSM module (SIM800L) for efficient data collection and alert generation. By integrating machine learning algorithms, the system analyzes sensor data to detect patterns and predict potential GLOF events, improving the accuracy of early warnings. The alert mechanism delivers real-time notifications through SMS, mobile applications, and cloud-based platforms, ensuring timely communication with authorities and local communities to minimize risks. Ultimately, this initiative enhances public safety, strengthens climate adaptation strategies, and reduces the loss of life, infrastructure damage, and environmental impact.

Keywords:

IoT-Based Early Warning, Glacial Lake Outburst Flood (GLOF), Disaster Preparedness, Risk Mitigation, ESP32, Vibration Sensors, Water Level Monitoring, Temperature Sensors, Tilt Sensors, GSM Communication, Machine Learning, Real-Time Alerts, Cloud-Based Monitoring, Climate Adaptation, Environmental Monitoring.

LORAWAN BASED TRANSFORMER MONITORING AND CONTROLLING USING MACHINE LEARNING

Mr.S K. Kabilesh[1], Veshnu M S[2], Yeluvu Sai Teja[3], Pullakomala Bharath[4], Vibin Anto[5]

[1]Associate Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

This project presents a LoRaWAN-based substation (transformer) monitoring and control system using machine learning for predictive maintenance and fault detection. Sensors collect real-time data on voltage, current, temperature, oil level, and vibration, transmitting it via LoRaWAN for analysis. ML algorithms detect anomalies and predict failures, enabling automated preventive actions. This approach enhances efficiency, reliability, and cost-effectiveness in smart grid management. Efficient monitoring and control of substations, particularly transformers, are critical for maintaining power system reliability and preventing failures. This paper presents a LoRaWAN-based system for real-time monitoring and control of substations, leveraging machine learning algorithms to enhance predictive maintenance and operational efficiency. The proposed system utilizes low-power long-range communication (LoRaWAN) to transmit vital transformer parameters such as temperature, voltage, current, and humidity to a centralized server. By integrating machine learning models, the system performs anomaly detection, fault prediction, and condition-based maintenance scheduling, significantly reducing downtime and maintenance costs. The architecture ensures secure data transmission, scalability, and low operational costs, making it suitable for remote and urban substations alike. Experimental results demonstrate improved monitoring accuracy and early fault detection compared to conventional systems. This approach not only enhances substation safety and reliability but also contributes to a smarter and more resilient power grid.

Keywords:

LoRaWAN, Transformer Monitoring, Substation Control, Machine Learning, Predictive Maintenance, Anomaly Detection, Smart Grid, Internet of Things (IoT) Integration.

IOT-BASED AUTOMATIC TICKETING SYSTEM FOR PUBLIC TRANSPORTATION USING GPS, RFID TAGS, AND ANDROID INTEGRATION

Prof S.Sandra[1], Pallapu Bhaskar[2], Parameshwari L[3], Subarna C[4], Unnam Chaitanya[5]

[1]Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Public transportation systems face challenges such as ticketing fraud, inefficiency in manual ticketing, and congestion during peak hours. To address these issues, an IoT-based automatic ticketing system is proposed, integrating RFID, GPS, and Android technology. This system utilizes RFID tags for passenger identification, GPS for real-time tracking, and an Android-based application for user interaction and fare management. The NodeMCU (ESP8266) microcontroller serves as the central processing unit, communicating with the RFID module (RC522) for ticket validation and the GPS module (GY-NEO6MV2) for location tracking. The collected data is transmitted to a cloud-based server for efficient fare calculation and transaction logging. This automation reduces human intervention, enhances security, and improves the overall efficiency of public transportation ticketing. The proposed system is a step toward seamless and intelligent transportation infrastructure, ensuring a hassle-free commuting experience for passengers.

Keywords:

IoT-Based Ticketing, Public Transportation, RFID Ticketing, GPS Tracking, Android Application, NodeMCU ESP8266, Automatic Fare Collection, Smart Ticketing, Cloud-Based Transaction, Intelligent Transportation, Passenger Identification, Real-Time Monitoring, Contactless Payment, Seamless Commuting, Digital Fare Management.

DESIGN AND SIMULATION OF A SOLAR-POWERED ELECTRIC CAR CHARGING STATION

Dr.P.Sivamani[1], P.Venkata Sai Narasimha[2], N.Jaswanth Raj[3], P.Deepika[4], S.Phani kumar[5]

[1]Associate Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The increasing demand for electric vehicles (EVs) highlights the urgent need for eco-friendly and sustainable charging solutions. This project proposes a solar-powered EV charging station that leverages photovoltaic (PV) panels to harvest solar energy and utilizes Maximum Power Point Tracking (MPPT) for maximum energy extraction. The harvested energy is stored in a lead-acid battery and is delivered to the EV through a buck converter, ensuring efficient voltage regulation. This off-grid system eliminates dependence on conventional grid-based power, reducing carbon emissions and supporting clean energy initiatives. The charging station addresses challenges such as fluctuating solar irradiance and energy conversion losses by integrating MPPT and energy storage technologies. Designed for off-grid and remote areas, it ensures reliable and continuous charging capabilities even in adverse conditions. By providing an efficient and cost-effective alternative to traditional grid-powered solutions, this project contributes to the development of sustainable EV infrastructure and promotes green energy adoption.

Keywords:

Solar Panel, Battery (Lead acid), Controller (node Mcu), Voltage senser, Lcd display, MMPT Controller, Software (Matlab).

IOT AND BLOCK CHAIN BASED DISTRIBUTED AGRICULTURE SYSTEM TO ASSIST SMART FARMING AND TRACK AUTHENTICITY OF FOOD SOURCE

Prof S.Sandra[1], Boomija. R. S[2], Goduguluru Sayyad Basha[3], Jangubai Khaja Mainuddin[4], Kishore Selvakumar[5]

[1]Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The rapid advancements in the Internet of Things (IoT) and Blockchain technology have opened new avenues for revolutionizing the agricultural sector. This project proposes an IoT and Blockchain-based Distributed Agriculture System to enhance smart farming practices and ensure the authenticity of food sources. The system integrates IoT sensors for real-time monitoring of soil conditions, crop health, temperature, humidity, and irrigation levels, enabling data-driven decision-making for improved agricultural productivity. The collected data is securely recorded on a Blockchain network, ensuring transparency, immutability, and traceability of agricultural practices. Smart contracts automate transactions between stakeholders, reducing inefficiencies and eliminating intermediaries. The system also provides farm-to-fork traceability, allowing consumers to verify the authenticity and quality of food products through a tamper-proof digital ledger. By leveraging IoT for precision farming and Blockchain for secure data management, this project aims to promote sustainable agricultural practices, minimize food fraud, and build consumer trust in the food supply chain. The proposed solution is scalable, cost-effective, and adaptable to various agricultural settings, making it a transformative approach toward smart and transparent agriculture.

Keywords:

IoT in Agriculture, Blockchain in Agriculture, Smart Farming, Precision Farming, Distributed Agriculture System, Real-Time Monitoring, Soil Condition Sensors, Crop Health Monitoring, Smart Contracts, Food Traceability, Farm-to-Fork Transparency, Secure Data Management, Sustainable Agriculture, Digital Ledger, Supply Chain Authenticity.

SMART WEARABLE DEVICE FOR WOMEN'S SAFETY USING IOT

Mrs.A.Berlin[1], Ummadi Ramya Sree[2] Shaik Mahamad Mouli[3], V.Badrinath[4], T. Sumanth Kenny[5]

[1]Assistant Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Women's safety is a growing concern worldwide, necessitating innovative solutions to ensure their protection. This paper presents an IoT-based smart wearable device designed to enhance women's using real-time location tracking, emergency alerts, and automated distress detection. By integrating sensors GSR SENSOR, PULSE SENSOR, TEMPERATURE SENSOR to monitor sudden movements, elevated heart rates, or other abnormal conditions, the device can trigger instant alerts to predefined contacts and authorities. Utilizing IoT and wearable technology, it ensures seamless communication and rapid response in emergency situations. This innovative solution enhances personal security, empowers women with a reliable safety mechanism, and promotes safer environments through proactive threat detection and real-time assistance. The proposed model aims to offer an effective, portable, and real-time solution for women's security.

Keywords:

IoT, Women Safety, Wearable Device, GPS, GSM, ESP32, Sensors, Alert System.

DEVELOPMENT OF AN ERGONOMIC HANDHELD FARMING TOOL FOR EFFICIENT SOIL PREPARATION AND REDUCED FARMER FATIGUE

Dr. G. Vetrichelvi[1], Mahiba V[2], Logu Prakash V[3], Nusi Rakesh Reddy[4], Terla Sai Jaswanth[5]

[1]Professor and Head, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Farming involves significant manual labor, and the result is many cases of repetitive work-related disorders such as levelling, sowing, and tilling. In the wake of such adversity, this project is focused on the development of a hand-held farming tool that is ergonomic for efficiency and minimum work load for the farmer. The tool is designed for ease of handling without compromising durability. Automation is utilized during the design for support during the process of tillage and levelling for the purpose of minimizing man-power exertions. Adjustment is also possible during the design for the capacity of the farmer for the ability to customize the tool for their desired setting for the purpose of accommodating the nature of the soil for maximum crop yield. NodeMCU-based wireless monitoring is also provided for the capability for the tool to be remotely controlled, thus the capability for the farmer for the ability to easily use the tool for the purpose of not necessarily handling the tool continuously. Fuel-run machinery is not required, thus the tool is environment friendly. The tool is affordable and simple for handling, thus suitable for small and marginal farmers for the purpose of maximum benefits. With the ergonomic design, the tool is enhanced for agricultural productivity through the utilization of automated and smart tools.

Keywords:

Ergonomic agricultural tool, Farmer health and efficiency, Handheld farming equipment, Adjustable tilling and levelling, Wireless monitoring.

VITA TRACK: A WEARABLE DEVICE FOR CONTINUOUS HEALTH MONITORING AND EARLY WARNING SYSTEM

Dr.G. Vetrichelvi[1], Gowtham R[2], Anurag Singh[3], Bala Siva Krishna[4], Infanta Christina Lourthu Mary S[5]

[1]Professor and Head, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Vita Track: A Wearable Device for Continuous Health Monitoring and Early Warning System enhances safety in hazardous environments with real-time health tracking. This IoT-based solution continuously monitors vital signs and environmental conditions using multiple sensors, including MAX30100 (heart rate and SpO2), AD8232 (ECG), MAX30208 (temperature), BMP280 (environmental monitoring), and the newly integrated mup 6050 sensor for motion detection. A GPS module ensures location tracking, while a panic button enables instant emergency alerts. The ESP32 microcontroller processes and transmits data to a cloud-based dashboard for remote monitoring, with real-time feedback displayed on an OLED screen. Predictive analytics trigger alerts for abnormal conditions to ensure timely interventions. The mup 6050 sensor enhances situational awareness by tracking motion, aiding in early detection of physical strain or emergencies. Vita Track's combination of IoT, cloud analytics, and wearable technology improves safety, response times, and overall well-being in high-risk settings.

Keywords:

IoT, Wearable Technology, Health Monitoring, Early Warning System, Real-Time Tracking

PEDESTRIAN SAFETY SYSTEM FOR URBAN ENVIRONMENT

Dr.P.Sivamani[1], Desu venkata Deekshith Reddy[2], R Madhava krishna[3], Livya S[4], J Hima Kiran[5]

[1]Associate Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The growing demand for smart city solutions has led to the development of intelligent transportation systems. This paper presents a Pedestrian Safety System that integrates pedestrian and vehicle detection to optimize street lighting. The system employs TCRT5000 IR sensors, HC-SR04 ultrasonic sensors, PIR motion sensors, and NeoPixel LEDs to enhance pedestrian safety and energy efficiency. The proposed model dynamically adjusts streetlight brightness based on real-time detection, providing enhanced visibility and energy savings. Experimental results demonstrate the system's effectiveness in reducing unnecessary power consumption while ensuring road safety.

Keywords:

Pedestrian Safety, Real-time detection, Street lighting optimization, Accident prevention.

LORA BASED GREEN HOUSE MONITORING AND CONTROL SYSTEM USING IOT

Vidhya Gowri V [1], Pranesh S [2], Priyadharshini S [3], Ramabathina Dinesh [4], Paduchuri Dattukumar[5]

[1]Associate Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

This project proposes a distributed, multi-span greenhouse monitoring and control system using LoRa communication and IoT technology to enhance agricultural productivity. Greenhouses provide a controlled environment for optimal plant growth while protecting crops from extreme weather conditions. The system continuously monitors key environmental factors such as temperature, moisture, illumination, pressure, and humidity. Automated control of devices like exhaust fans, sprinklers, and lighting systems is implemented based on predefined logic and climate conditions. Smart Alerts notify farmers of environmental stress or hardware failures through real-time app notifications. Additionally, Automated Contingency Protocols and Weather-Linked Automation ensure proactive responses to emergencies, minimizing risks. By integrating real-time monitoring and intelligent automation, this system optimizes crop growth, improves resource efficiency, and enhances resilience against environmental uncertainties.

Keywords:

LoRa, IoT, Greenhouse Monitoring, Real-Time Control, Resource Optimization, LoRa Communication, Low-Power Connectivity, Environmental Sensing, Automated Alerts, Precision Agriculture, Sustainability, Smart Farming.

VISION AID: AN AI-DRIVEN ASSISTIVE SYSTEM FOR READING TEXT ON BRIGHT DISPLAYS AND OBJECT RECOGNITION FOR THE VISUALLY IMPAIRED

Dr. C. Shanmugam[1], Pasam Venkata Ramanjineyulu[2], Nadipi Bhargav[3], Noor Aarifa[4], Patan Mahammad Khan[5]

[1]Associate Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Vision Aid is an AI-driven assistive system designed to enhance accessibility for visually impaired individuals by enabling seamless text reading on bright displays and object recognition in real-world environments. The system leverages advanced Optical Character Recognition (OCR) technology powered by artificial intelligence to extract and convert textual information into audible speech. This feature allows users to access digital and printed text even in challenging lighting conditions, such as high-glare screens and reflective surfaces, ensuring a more inclusive reading experience. In addition to text reading, Vision Aid incorporates real-time object recognition to assist visually impaired users in identifying and understanding their surroundings. Utilizing deep learning-based computer vision models, the system detects and describes objects, signage, and obstacles, enhancing spatial awareness and navigation. The integration of AI ensures adaptability to various environments, making the system useful for indoor and outdoor applications, including public spaces, workplaces, and home settings. To provide an intuitive and user-friendly experience, Vision Aid features voice-controlled navigation, allowing users to interact with the system through spoken commands. Natural Language Processing (NLP) enhances accuracy in text recognition and speech output, supporting multiple languages and fonts. This interactive design enables users to operate the system independently without the need for complex manual inputs, significantly improving usability and accessibility. By combining AI-powered text reading, object recognition, and voice-assisted control, Vision Aid empowers visually impaired individuals to engage more effectively with their surroundings. The system's ability to convert visual data into audible feedback promotes greater independence, mobility, and inclusion in everyday life. Vision Aid represents a significant step toward improving accessibility through assistive technology, making information and navigation more accessible to those with visual impairments.

Keywords:

AI Assistive Technology, Vision Aid, Optical Character Recognition (OCR), Object Recognition, Computer Vision, Deep Learning, Speech Output, Accessibility, Visually Impaired, Text-to-Speech, Voice-Controlled Navigation, Natural Language Processing (NLP), Inclusive Technology, Smart Assistance, Mobility Aid

CHILD LIFE PROTECTION SYSTEM FROM UNSAFE BORE-WELL ZONE

Dr.C.Shanmugam[1], Harshini K[2], Avinash A[3], Chenchamgari Yeshaya[4], Cherukuri Veera Venkata Gopinadh[5]

[1]Associate Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The automated dual-layer borewell closure system is designed to prevent child entrapment and enhance emergency response efficiency in borewell accidents. These incidents pose critical challenges due to confined spaces, restricted oxygen levels, and complex rescue operations, making traditional methods time-consuming and hazardous. This system employs an advanced sensor-based mechanism to detect falls in real time and deploys a dual-layer closure system positioned at two levels, spaced five feet apart. The first closure activates immediately upon detecting an intrusion, while the second serves as a fail-safe, ensuring enhanced safety and reliability. Additionally, the system integrates real-time monitoring and alerting features, sending instant SMS notifications with precise GPS location data, borewell environmental conditions, and oxygen levels to emergency response teams. The IoT-enabled sensors provide continuous monitoring, allowing for proactive maintenance and detection of hazardous conditions. Designed for seamless integration into existing borewell structures, this solution is cost-effective and scalable.. Furthermore, an emergency rescue module can be incorporated to assist responders with real-time borewell depth analysis and environmental assessment, ensuring a well-informed rescue strategy. By combining intelligent safety mechanisms, rapid detection, and real-time communication, this system aims to reduce borewell-related fatalities, improve response efficiency, and ensure child safety in open borewell environments while setting a foundation for future advancements in automated rescue technologies.

Keywords:

Borewell safety, IoT, fall detection, , child safety, GPS tracking, SMS alert system.

WHEELS OF FREEDOM: THE GESTURE CONTROLLED WHEELCHAIR

V Vidhya Gowri[1], Guntamadugu Pavan Kumar[2], Haripriya V[3], Kajjuru Tirumalesh[4], Lakshmi Narayanan N[5]

[1]Associate Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The Gesture-Controlled Wheelchair is an assistive mobility device designed for individuals with physical disabilities, enabling effortless movement through intuitive hand gestures. It incorporates an MPU6050 accelerometer to detect hand tilts for directional control and flex sensors to recognize finger movements for special functions such as activating an emergency buzzer. An Arduino Nano processes these inputs and transmits commands wirelessly via an NRF24L01 transceiver. At the receiving end, an Arduino Uno interprets the signals and controls the wheelchair's motors using an L298N motor driver. For enhanced safety, ultrasonic sensors at the front and rear detect obstacles, allowing automatic stopping or movement adjustments to prevent collisions. This system offers a cost-effective, reliable, and user-friendly solution to improve mobility and independence for people with disabilities. Key words: Keywords: Gesture-controlled wheelchair, assistive mobility, and accelerometer, flex sensors, Arduino, wireless control, motor driver, obstacle detection, physical disabilities.

Keywords:

Gesture-Controlled Wheelchair, Assistive Mobility, Accelerometer, Flex Sensors, Arduino Nano, Arduino Uno, Wireless Control, NRF24L01, Motor Driver, Obstacle Detection, Ultrasonic Sensors, Physical Disabilities, Adaptive Technology, Smart Wheelchair

INTELLIGUARD: ADVANCED SMART HELMET SYSTEM FOR MOTORCYCLES

K.Kokila[1], Akshay.P[2], Athipati Pavan[3], Challagundla Harikrishna[4], Divyabharathi K[5]

[1]Assistant Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Motorcycle safety is a major concern, requiring intelligent solutions to reduce risks. This paper presents a Smart Helmet System, integrating IoT and embedded systems to enhance rider safety through features such as alcohol detection, helmet usage enforcement, accident detection, emergency response, real-time health monitoring, and GPS tracking. The alcohol detection module (MQ-3 sensor) analyzes the rider's breath, preventing ignition if alcohol is detected, while an IR-based helmet usage mechanism ensures the bike starts only when the helmet is worn. An accelerometer-based accident detection module triggers automated alerts via a GSM module, sending real-time location updates through GPS for emergency response. Additionally, heart rate and temperature sensors provide continuous health monitoring to assess the rider's well-being. By integrating these components into a compact, user-friendly design, the Smart Helmet System significantly enhances motorcycle safety. This research contributes to proactive accident prevention, leveraging real-time monitoring and automated emergency response to reduce fatalities and injuries. The system's seamless integration with IoT ensures efficient data transmission for improved safety and rapid intervention, making it a comprehensive and effective safety solution for motorcyclists.

Keywords:

Smart Helmet, Motorcycle Safety, IoT, Accident Detection, Health Monitoring, GPS Tracking, Embedded Systems.

AI-POWERED PRECISION AGRICULTURE FOR CLIMATE-RESILIENT FARMING

Dr.P.Sivamani[1], Nivetha G[2], Nivethitha G I[3]

[1]Assistant Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-3] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Climate change has severely impacted agriculture, causing unpredictable weather patterns, water scarcity, and declining crop yields. Traditional farming methods struggle to adapt to these rapid changes, leading to inefficient resource use and environmental degradation. This paper presents an AI-powered Precision Agriculture system that integrates Artificial Intelligence (AI), Internet of Things (IoT), and real-time data analytics to optimize irrigation, crop health monitoring, and climate forecasting. The proposed system utilizes AI-driven sensors, drones, and predictive models to enhance resource efficiency, reduce waste, and improve climate adaptability. Experimental results demonstrate the effectiveness of this system in increasing productivity while ensuring sustainable and eco-friendly farming practices.

Keywords:

AI in Agriculture, Precision Farming, Climate Resilience, Smart Irrigation, Sustainable Farming.

NEXT GENERATION UAV COLLISION AVOIDANCE USING DOPPLER RADAR AND LIDAR SENSOR

Dr.T.Meenakshi[1], Gurram jagadeesh[2], Jayasri S[3], Logesh M[4], Konduru.Lokesh[5]

[1]Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5] UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The next generation of UAV (Unmanned Aerial Vehicle) collision avoidance systems faces increasing challenges as airspace becomes more congested and the demand for safe, autonomous flight grows. Traditional collision avoidance systems often rely on basic sensor technologies that may struggle to detect and respond to rapid, unpredictable movements of other airborne objects. As a result, UAVs may be at risk of collision, especially in complex or dynamic environments such as urban airspaces or crowded skies. This project aims to address these challenges by developing an advanced collision avoidance system that integrates Doppler radar and LiDAR sensors in an innovative way. The combination of these technologies allows for real-time detection of obstacles and other flying objects, while the Doppler radar helps track their velocity and movement. LiDAR provides highly accurate 3D mapping, enabling the UAV to construct a detailed environment model and navigate more effectively. This dual-sensor system enhances both situational awareness and decision-making processes, ensuring safer flight paths and reducing the risk of collisions. By utilizing voice or autonomous control features, UAVs can respond dynamically to changes in the environment, adjusting their flight paths in real-time for optimal safety and efficiency. This system aims to revolutionize UAV operations, particularly in crowded airspace and complex, rapidly changing environments.

Keywords:

Lidar sensor, Doppler radar sensor, UAV, autonomous control.

SMART IOT FRAMEWORK FOR CLIMATE RESPONSIVE MORINGA CULTIVATION USING MACHINE LEARNING

Dr. N. Krishnapriya[1], Madana Vasuda[2], Mallela Daniel Raj[3], Mandla Sreeram[4], S.Pranesh[5]

[1]Associate Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5]UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Agriculture in India is highly dependent on rainfall, which is often unpredictable, making it challenging for farmers to achieve consistent crop yields. The integration of modern technology into agriculture has the potential to revolutionize traditional farming methods by providing data-driven insights that enhance productivity and sustainability. Smart farming, powered by the Internet of Things (IoT) and Machine Learning (ML), plays a crucial role in optimizing agricultural practices by analyzing various environmental factors such as soil health, temperature, and rainfall patterns. Climate-responsive agriculture leverages real-time weather forecasting data and soil parameters to recommend the most suitable crops for cultivation under prevailing conditions. This approach not only improves crop yields but also ensures efficient resource utilization, minimizing wastage of water, fertilizers, and pesticides while maximizing output. Precision agriculture further enhances farming efficiency by enabling farmers to make informed decisions based on predictive analytics, reducing the risks associated with unpredictable weather patterns. One of the key applications of this technological advancement is in Moringa cultivation, a highly nutritious and drought-resistant crop with immense economic and health benefits. By integrating an Android-based application, farmers can receive real-time recommendations on the most profitable crops based on current environmental conditions, thereby increasing productivity and profitability. The proposed system serves as a bridge between traditional farming techniques and modern technological advancements, empowering farmers with knowledge and tools that enable them to adapt to climate change, optimize their agricultural output, and contribute to sustainable farming practices. As agriculture remains the backbone of the Indian economy, implementing such intelligent solutions can significantly enhance food security, improve the livelihoods of farmers, and promote eco-friendly agricultural practices that ensure long-term sustainability in the sector.

Keywords:

IoT, Machine Learning, Climate-Responsive Agriculture, Moringa Cultivation, Smart Farming, Precision Agriculture

REAL-TIME 3-PHASE POWER MONITORING SYSTEM USING IoT

Mr.S.Prakash[1], Dharshani B[2], Hemanth Prasaath K[3], Bandi Midhun[4]

[1]Assistant Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5]UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The Real-Time 3-Phase Power Monitoring System is designed to efficiently measure and analyze electrical parameters such as voltage, current, and power consumption industrial and commercial environments. The system utilizes an ESP32 microcontroller to acquire data from voltage and current sensors, which are then processed and transmitted wirelessly via Wi-Fi to an IoT-based dashboard for real-time monitoring. For improved efficiency, the system integrates an IoT platform that allows users to visualize power consumption trends, detect anomalies, and receive alerts in case of faults or abnormal fluctuations. Additionally, the system enables remote monitoring and data logging, enhancing energy management and predictive maintenance strategies. This cost-effective and scalable solution provides industries with a smart energy monitoring approach, optimizing power utilization and preventing potential electrical failures.

Keywords:

3-phase power monitoring, IoT, ESP32, voltage sensor, current sensor, real-time monitoring, energy management, fault detection.

INTELLIGENT SMART CARE BED FOR ELDERLY HEALTH MONITORING

Mrs.K.Kokila[1], Challa Jayavardhan[2], Darshan S[3], Haripriyanga V[4]

[1]Assistant Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-4]UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Manually adjusting hospital beds presents significant challenges for healthcare professionals, impacting both their workflow and patient care outcomes. These manual adjustments are time-consuming, leaving nurses with less time to attend to other important tasks. As a result, patient needs may be delayed, and the overall quality of care may decrease. Moreover, manually adjusting the bed to ensure safety and comfort can be risky, potentially leading to improper positioning that exacerbates existing medical conditions or causes discomfort and pressure sores. Additionally, the demand for frequent and accurate bed adjustments throughout the day increases the pressure on nurses, especially in high-turnover or complex care settings. This project aims to address these issues by developing a hospital bed that responds to voice commands, enhancing patient care and monitoring. The bed's voice recognition technology allows patients to adjust their positions independently, improving comfort and accessibility, particularly for those with mobility challenges.

Keywords:

IoT, Health Monitoring, Warning System, Real-Time Tracking

GAS PIPELINE SAFETY IN APARTMENTS USING LORAWAN TECHNOLOGY

Prof S.Prakash[1], Rabin Ram.R[2], Ruba.P[3], Shaik Firoz[4], Sujith Kharsan.G[5]

[1]Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5]UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Gas pipeline safety in apartment buildings is crucial due to the potential hazards posed by leaks, such as explosions and health risks. Traditional monitoring methods often fail to provide real-time data or scalability. This paper presents a LoRaWAN-based system designed to enhance gas pipeline safety in apartments. LoRaWAN, a low-power, long-range communication protocol, is Ideal for IoT-based sensor networks. The system uses wireless gas sensors to monitor hazardous gases like methane and LPG, transmitting data to LoRaWAN gateways connected to a cloud-based platform. The platform processes the data and triggers alerts in case of gas leaks or anomalies. Predictive maintenance is achieved by analyzing sensor data for potential faults, reducing the risk of accidents. The system provides real-time alerts to residents and management via mobile apps. Additionally, it offers energy-efficient communication with long battery life for sensors. The scalable nature of LoRaWAN makes it suitable for large apartment complexes. The system ensures continuous monitoring, reliability, and low-cost implementation. This approach enhances safety by enabling early detection, faster response times, and proactive maintenance, making it a promising solution for modern apartment gas safety.

Keywords:

LoRaWAN, Gas Pipeline Safety, IoT, Wireless Gas Sensors, Methane Detection, LPG Monitoring, Predictive Maintenance, Real-Time Alerts, Cloud-Based Monitoring, Energy-Efficient Communication, Apartment Safety, Smart Building Solutions

IOT BASED RFID DRIVEN EMERGEMCY VEHICLE PRIORITY SYSTEM

Mrs.A.Berlin[1], Harish Kumar K[2], Kiruba E[3], Gowri Siva Sai CRP[4]

[1]Assistant Professor, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5]UG Students, Department of Electronics and Communication Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The Smart Emergency Vehicle Priority System is an IoT-based solution designed to improve emergency response times and enhance road safety by utilizing RFID technology to detect approaching emergency vehicles and dynamically adjust traffic signals. This ensures seamless and low-cost integration with existing infrastructure. Key components include ESP32 for data processing and communication, RFID readers for vehicle identification, and cloud-based analytics for real-time monitoring. The system prioritizes ambulances, fire trucks, and police vehicles by temporarily overriding normal traffic light operations, reducing delays at intersections. A GPS module ensures precise tracking, while an OLED display provides real-time system feedback. Predictive analytics help optimize traffic management, ensuring efficient and timely interventions. By combining IoT, cloud computing, and smart traffic control, this system significantly enhances road safety, emergency response times, and overall traffic efficiency in urban environments. The system is designed to function autonomously with minimal human intervention, making it highly reliable and efficient in critical situations. By leveraging IoT and cloud-based data processing, traffic control centers can remotely monitor and analyze traffic patterns, leading to smarter decision-making and better traffic flow management. Additionally, the integration of machine learning algorithms can further improve system accuracy by adapting to real-time traffic conditions. This scalable and cost-effective solution enhances road infrastructure, ensuring emergency responders can reach their destinations faster, ultimately saving lives and improving urban mobility.

Keywords:

IoT, RFID, Smart Traffic Control, Emergency Vehicle Priority

INNOVATIVE EMI MITIGATION TECHNIQUES FOR NEXT-GENERATION ELECTRONICS

C. Swedheetha[1], V. Muneeswaran[2], K Naresh kumar[3]

[1]Assistant Professor, Department of Computer Science and Engineering, Velammal Engineering College, Madurai, India.

[2]Associate, Department of Electronics and Communication Engineering, Kalasalingam Academy of Research and Education, Krishnankoil, India.

[2]PG Student, Department of Electronics and Communication Engineering, Kalasalingam Academy of Research and Education, Krishnankoil, India.

Abstract:

Electromagnetic interference (EMI) is a critical challenge in modern electronic system design, affecting performance, reliability, and regulatory compliance. This paper presents a novel EMI reduction method that integrates advanced signal processing techniques, optimized PCB design strategies, and shielding methodologies. The proposed approach focuses on minimizing radiated and conducted emissions by implementing adaptive filtering, impedance matching, and innovative grounding techniques. Additionally, a machine learning-based EMI prediction model is introduced to enhance real-time interference mitigation. Experimental validation demonstrates a significant reduction in EMI levels across various electronic systems, ensuring improved signal integrity and compliance with electromagnetic compatibility (EMC) standards. The proposed methodology provides a cost-effective and scalable solution for next-generation electronic system design.

Keywords:

EMI Reduction, Electromagnetic Compatibility (EMC), PCB Design, Signal Integrity, Shielding, Machine Learning.

SMART RESPIRATORY MONITORING: A WIRELESS SENSOR AND MACHINE LEARNING-BASED DIAGNOSTIC SYSTEM

P. Manikandan[1], V. Muneeswaran[2], K Naresh Kumar[3]

[1-2]Associate, Department of Electronics and Communication Engineering, Kalasalingam Academy of Research and Education, Krishnankoil, India.

[3]PG Student, Department of Electronics and Communication Engineering, Kalasalingam Academy of Research and Education, Krishnankoil, India.

Abstract:

Respiratory diseases such as asthma, chronic obstructive pulmonary disease (COPD), and pneumonia pose significant health risks worldwide. Early diagnosis and continuous monitoring are crucial for effective treatment and management. This paper presents a wireless sensor-based respiratory disease diagnosis and reporting system that leverages respiratory sound analysis and machine learning techniques. The system consists of wearable sensors that capture respiratory sounds in real time, transmitting data wirelessly to a cloud-based processing unit. Advanced machine learning algorithms, including deep learning and feature extraction techniques, are employed to classify respiratory conditions based on sound patterns. The proposed system enables remote monitoring and automatic disease classification, allowing healthcare professionals to receive timely reports and make informed clinical decisions. Experimental results demonstrate high accuracy in disease detection, showcasing the potential of the system for non-invasive, cost-effective, and scalable respiratory health monitoring.

Keywords:

Wireless Sensor Networks, Respiratory Disease Diagnosis, Machine Learning, Respiratory Sound Analysis, Healthcare Monitoring.

EXPLORING THE NATURAL COAGULANTS FOR WATER TREATMENT

Mrs.L.Agnes Preethi[1], K.Veerendra[2], P.Sai Srinivas[3], U.Gowtham Kishore[4]

[1]Assistant Professor, Department of Civil Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5]UG Students, Department of Civil Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Access to clean and safe drinking water remains a critical global challenge, necessitating effective and sustainable water treatment methods. In this Project, we conducted a comparative investigation to assess the efficacy of natural coagulants—neem powder and orange peel powder—in treating waste water samples. Waste water samples were collected from a single source and subjected to treatment using both conventional chemical methods and natural coagulants, followed by natural sedimentation. Various parameters including pH, total dissolved solids (TDS), total suspended solids (TSS), and turbidity were meticulously measured in treated and untreated samples to evaluate treatment effectiveness. Results from the study revealed that while initial treatment with conventional chemicals exhibited superior outcomes, further analysis revealed significant drawbacks, rendering it less desirable. Conversely, treatment with natural coagulants—neem powder and orange peel powder—yielded promising results, with all tested parameters falling within acceptable ranges. This suggests that the use of natural coagulants in conjunction with natural sedimentation presents a viable alternative for water treatment, offering a sustainable solution with minimized environmental impact. The findings of this Project underscore the potential of natural coagulants as effective agents for water treatment, emphasizing the importance of exploring eco-friendly alternatives in addressing the global challenge of water scarcity and pollution. Further research and implementation efforts in this direction are warranted to harness the full potential of natural coagulants for ensuring access to safe drinking water for all.

Keywords:

Clean drinking water, Water treatment, Natural coagulants, Neem powder, orange peel powder, Wastewater treatment, pH, Total dissolved solids (TDS) , Total suspended solids (TSS), Turbidity, Conventional chemical treatment, Natural sedimentation, Sustainable solution, Environmental impact, Water pollution.

SMART IRRIGATION SYSTEM FOR PRECISION FARMING

Mr. K.Maadeshkumar[1], R. Bharath Yadav[2], J. Sri Hari[3], G. Karthik[4], CH. Sai Virinchi[5]

[1]Assistant Professor, Department of Mechanical Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5]UG Students, Department of Mechanical Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Agriculture is crucial for food security and economic stability, yet farmers face challenges in optimizing crop yield and managing plant diseases due to unpredictable weather, soil health issues, and traditional practices. This project proposes an intelligent Machine Learning (ML)-based system to improve decision-making in crop selection and disease detection. By integrating real-time environmental data and image-based disease diagnosis, the system empowers farmers with automated, data-driven tools to enhance productivity. The system helps farmers select suitable crops by analyzing environmental parameters such as temperature, humidity, soil pH, and moisture levels. ML algorithms predict the best crops for a specific region and season, optimizing resource usage and increasing yield potential. Additionally, the system addresses plant disease management by using an ESP32CAM module for image acquisition and a Convolutional Neural Network (CNN) for disease classification. The CNN model, trained on a vast dataset, accurately identifies diseases and suggests treatments, allowing for timely intervention. This solution enhances agricultural decision-making, reduces manual effort, and minimizes crop losses through early disease detection. By optimizing resource use and improving yields, it supports sustainable farming practices, contributing to rural livelihoods, food security, and economic growth in agriculture-dependent regions. The ML-powered system brings innovation and resilience to traditional agriculture, promoting a more productive and sustainable future.

Keywords:

ESP32CAM module, Temperature sensor, Humidity sensor, Soil pH sensor, Moisture sensor. Machine Learning (ML), Convolutional Neural Network (CNN). CNN model.

DESIGN, ANALYSIS & FABRICATION OF DRONE FRAME

J Kiran[1], N Sharan Raj[2], K Subash Chandra Bose[3], S Balasurya[4]

[1-4]UG Students, Department of Mechanical Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Unmanned Aerial Vehicles (UAVs) are widely used in applications such as surveillance, logistics, and environmental monitoring, where structural integrity and weight optimization play a crucial role in performance. This project focuses on engineering modelling of an optimized drone frame by evaluating different materials and structural configurations. The structural performance is analyzed using Finite Element Analysis (FEA), considering key parameters such as weight, maximum stress, strain, deflection, and directional deformation. The frame design is developed using SolidWorks and Creo, incorporating multiple configurations to determine the most efficient structural layout. Material selection is carried out using the Ashby chart. Analytical simulations are performed to assess mechanical behavior under different loading conditions, and the results are validated through numerical simulations using FEA to gain deeper insights into structural integrity and overall performance. The systematic approach followed in this study provides a foundation for future UAV design enhancements, particularly in applications requiring high maneuverability and endurance.

Keywords:

Drone Frame Design, Quadcopter Structure, Finite Element Analysis (FEA), Additive Manufacturing.

DEVELOPMENT OF AUTO MECHANISM FOR SOLAR PANEL ROTATION TO GET EFFECTIVE TRACKING THE SUN MOVEMENT

Mr. F. Alexander[1], D. Ismail[2], E. Vinay Reddy[3], K. Hamsavardhan Reddy[4], P. Siva Kiran Kumar[5]

[1]Assistant Professor, Department of Mechanical Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5]UG Students, Department of Mechanical Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The most promising of the renewable energy sources is solar energy, whose efficiency is greatly dependent on the panel's orientation towards the sun. Traditional tracking systems, while effective, are wasteful in terms of power as they constantly move. This project suggests an ultra-low power solar tracking system that optimizes the placement of solar panels through a time-based rotation system instead of continuous tracking. The device tilts the panel during certain hours of the day (45°, 75°, 90°, 125°, and 175°) for maximum exposure to sunlight while using less than 5mAh of power per day. The heart of this project is an ESP32 microcontroller, in conjunction with a Real-Time Clock (RTC) module to execute accurate movements using DC and servo motors. A MOSFET power control system ensures energy is only being used where it is needed, minimizing wastage of power. For a better user interface, an I2C LCD display shows real-time information on the panel's position and system performance. The whole installation is energized by a solar panel and a rechargeable 12V battery, thus making it a self-sufficient and environmentally friendly option. By doing away with complicated and power-consuming tracking systems, this project presents an affordable, efficient, and sustainable option for residential and commercial solar applications.

Keywords:

Solar tracking, ESP32, energy-efficient automation, time-based adjustment, renewable energy, DC motors, RTC module, MOSFET power control, smart solar technology, sustainability.

SUSTAINABLE BIOFUEL PRODUCTION THROUGH BIOMASS CONVERSION

Dr.M.Muthukumaran[1], P.Vignesh[2], K. Gowtham[3], C. Amalraj[4], R. Subash[5]

[1]Professor and Head, Department of Mechanical Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5]UG Students, Department of Mechanical Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

The growing demand for renewable energy has sparked significant interest in biomass as a sustainable feedstock for biofuel production. This study explores the conversion of biomass into biofuel through the pyrolysis process, utilizing onion shell powder as the primary feedstock. Pyrolysis, a thermochemical process performed in the absence of oxygen, yields bio-oil, biochar, and syngas, which can serve as viable alternative energy sources. To improve the efficiency of biofuel production, a catalyst is employed to optimize reaction conditions, maximize bio-oil yield, and enhance fuel properties. Key fuel properties of the biofuel, such as density, viscosity, flash point, fire point, and calorific value, are evaluated to assess its quality and performance. These parameters are crucial for determining the combustion characteristics, safety, and efficiency of the produced biofuel. A comparative analysis with conventional fossil fuels is conducted to evaluate energy output, ignition properties, and environmental impact. The results provide valuable insights into the viability of biofuels as a sustainable energy source and highlight areas for further optimization in industrial applications. This research also contributes to the growing body of knowledge on the development of cleaner, more efficient biofuels as an alternative to fossil fuels. The bio-oil is assessed for its calorific value and chemical composition, while biochar and syngas are examined for potential applications. By using onion shell powder, an agricultural waste product, this study not only promotes waste valorization but also advances sustainability. The findings emphasize that optimized catalytic pyrolysis can significantly enhance biofuel yield and properties, offering an environmentally friendly alternative to traditional fossil fuels.

Keywords:

Biomass, Pyrolysis, Onion Shell Powder, Biofuel, Renewable Energy, Sustainability

EFFECTS OF STACK SEQUENCING ON WEAR PROPERTIES OF WOVEN HEMP/WOOL FABRIC REINFORCED COMPOSITE

Prof. S. J David Hans[1], Ragul Raj G[2], Karan Leander A[3], Yuvan Sanjay SG[4], Balamurugan J[5]

[1]Professor, Department of Mechanical Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5]UG Students, Department of Mechanical Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

This study investigates the effects of stack sequencing on the mechanical and wear properties of woven hemp/wool fabric-reinforced composites. Natural fiber composites, such as those made from hemp and wool, have gained significant attention due to their eco-friendliness, biodegradability, and sustainability. However, their performance is highly influenced by the arrangement of fiber layers, known as stack sequencing, which determines the composite's strength, flexibility, and wear resistance. In this research, composites with different stack sequences were fabricated using epoxy resin as the matrix material. The composites were subjected to a series of mechanical and wear tests, including the Izod impact test, Shore D hardness test, wear test, and flexural test, to evaluate their performance under various loading conditions. The results demonstrate that stack sequencing significantly influences the mechanical and wear properties of the composites. Composites with a higher proportion of hemp fibers exhibit greater tensile strength, stiffness, and wear resistance, while those with more wool fibers show improved flexibility and impact absorption. Hybrid stack sequences provide a balance of strength and flexibility, making them suitable for applications requiring both durability and impact resistance. The wear test results reveal that hemp-dominated composites exhibit lower wear rates due to the high strength and stiffness of hemp, while wool-dominated composites show higher wear rates but improved flexibility. The flexural test results highlight the importance of fiber arrangement in determining the composite's bending strength and failure behavior. The findings of this study provide valuable insights into the design and optimization of woven hemp/wool fabric-reinforced composites for industrial applications. By optimizing stack sequencing, researchers can enhance the mechanical and wear properties of natural fiber composites, enabling their use in demanding applications such as automotive components, construction materials, and protective gear. This research contributes to the development of sustainable, high-performance materials that combine the unique properties of hemp and wool fibers, offering a viable alternative to synthetic fiber composites. The study underscores the importance of stack sequencing in determining the performance of natural fiber composites and provides a foundation for future research in this field.

Keywords:

Natural Fiber Composites, Mechanical Properties, Wear Properties, Fiber-Matrix Interface, Eco-friendly Materials.

AUTOMATIC MOTORIZED STAIRCASE CLIMBING SYSTEM FOR GOODS TRANSPORTATION

Mr.V.Murali[1], P.Arjun[2], T.Ragavan[3], K.R.Siva Balan[4]

[1]Assistant Professor, Department of Mechanical Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5]UG Students, Department of Mechanical Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Transporting heavy goods up and down staircases is a challenging and labor-intensive task. This project presents a Manual Motorized Staircase Climbing System, designed to assist in the efficient movement of goods across stairs with minimal effort. The system integrates a motorized mechanism with a manually controlled interface, allowing operators to transport loads smoothly while reducing physical strain. The design consists of high-torque motors, a stable frame, and specialized wheels or tracks to provide controlled movement over staircases. The user operates the system through a simple control mechanism, enabling precise speed and direction adjustments. The motorized assistance ensures better load stability and reduced manual effort, making it an ideal solution for warehouses, delivery services, and industrial applications. Testing results demonstrate that the system significantly improves efficiency, reduces lifting risks, and enhances safety when compared to traditional manual carrying methods. While the current model is designed for standard staircases, future improvements could focus on lightweight materials, adjustable load capacity, and improved power efficiency for broader applications. This system offers a cost-effective and practical solution for industries requiring frequent transportation of goods over staircases

Keywords:

Motorized Staircase Climbing System, Goods Transportation, Motorized Mechanism, Manually Controlled Interface, High-Torque Motors, Specialized Wheels or Tracks, Load Stability

EXPERIMENTAL STUDY ON BEHAVIOUR OF PAVER BLOCK USING RECYCLED AGGREGATES WITH 10% OF FOUNDRY SAND

Mrs.Shanmugapriya S[1], Naveen Raj AM[2], Naqvi Ahmed PH[3], Sarathkumar E[4], Ravi Shankar M[5]

[1]Assistant Professor, Department of Civil Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5]UG Students, Department of Civil Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

This experimental study investigates the feasibility of using recycled aggregates and foundry sand in the production of paver blocks. The study focuses on evaluating the mechanical and physical properties of paver blocks made with recycled aggregates and 10% foundry sand. A total of 36 paver block specimens were cast and tested for compressive strength, flexural strength, water absorption, and density. The results show that the paver blocks made with recycled aggregates and foundry sand exhibit satisfactory mechanical and physical properties, meeting the requirements of Indian standards. The compressive strength and flexural strength of the paver blocks were found to be 34.5 MPa and 4.2 MPa, respectively. The water absorption and density of the paver blocks were 2.5% and 2150 kg/m^3, respectively. The study demonstrates the potential of using recycled aggregates and foundry sand in the production of paver blocks, providing a sustainable and environmentally friendly alternative to traditional materials.

Keywords:

Recycled aggregates, Foundry sand, Paver blocks, Mechanical properties, Physical properties, Sustainability.

BIM BASED SIMULATION AND ANALYSIS FOR SUSTAINABLE RESIDENTIAL BUILDING

Mr.Saravana Kumar V[1], Hebic Joel M[2], Abishek A[3], Viswanth B[4]

[1]Assistant Professor, Department of Civil Engineering, Jansons Institute of Technology, Coimbatore, India.

[2-5]UG Students, Department of Civil Engineering, Jansons Institute of Technology, Coimbatore, India.

Abstract:

Building Information Modeling (BIM) plays a vital role in improving sustainability within the construction industry. Conventional design approaches rely on static assessments, limiting flexibility in decision-making. Implementing BIM-based simulation enhances efficiency by integrating 2D and 3D modeling, energy simulations, material optimization, and AR/VR visualization. A structured methodology, including design conceptualization, performance analysis, cost estimation, and project management, ensures optimal resource utilization. Advanced tools allow real-time monitoring of energy efficiency, material sustainability, and thermal performance, enabling data-driven decisions throughout development. Sustainable features, such as solar panels on terraces and green spaces across multiple levels, promote renewable energy use and environmental well-being. Smart construction techniques improve cost-effectiveness while reducing waste, making projects more eco-friendly. Architects, engineers, and project managers benefit from a comprehensive framework that integrates technology-driven solutions for sustainable building practices. Enhancing design flexibility and construction efficiency leads to structures with reduced carbon footprints and lower operational costs. Simulation-based insights support informed choices, ensuring long-term sustainability in residential buildings. A forward-thinking approach leveraging modern tools and sustainable strategies contributes to greener urban environments. Innovative digital workflows drive the future of environmentally responsible architecture, offering practical solutions to current challenges in energy consumption and resource management.

Keywords:

BIM, Sustainable Design, Energy Simulation, AR/VR, Project Management, Green Building, Smart Construction

DESIGN AND DEVELOPMENT OF MICRO DEEP DRAWING SYSTEM

P. GopalaKrishnan[1], M. Arun Prakash[2]

[1]Scholar, Department of Mechanical Engineering, Kathir College of Engineering, Coimbatore.

[2]Assistant Professor, Department of Mechanical Engineering, Kathir College of Engineering, Coimbatore.

Abstract:

The project focuses on the design and development of a die system for the micro deep drawing process, a critical metal forming operation used to manufacture of micro components. The primary objective is to optimize the die-making process to ensure high precision, durability, and cost-effectiveness while minimizing defects like wrinkling, tearing, and earing. The project involves a systematic approach, beginning with the analysis of product requirements and material properties. Advanced tools such as CAD software is employed to design and validate the die configuration. Materials for the die are carefully selected based on their wear resistance, strength, and machinability. Manufacturing processes include machining, heat treatment, and surface finishing to ensure the die's longevity and performance. Simulation and experimental trials are conducted to refine the die and eliminate potential issues, enhancing its formability and production efficiency. The project aims to contribute to industrial practices by providing a robust, optimized die-making process that improves product quality and reduces material waste. This research underscores the importance of integrating advanced design techniques and testing methodologies in modern manufacturing systems.

Keywords:

Deep drawing, micro parts, non-ferrous alloys