CONFERENCE PROCEEDING
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VOLUME - I

EDITORS

Rev. Sr. Dr. M. BABY

Dr. R. RUBAN

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INTERNATIONAL CONFERENCE ON

SMART INNOVATION TECHNOLOGIES
&
ARTIFICIAL INTELLIGENCE FOR SUSTAINABLE DEVELOPMENT
(ICSAS-2026)

VOLUME - I

ORGANIZED BY

ST.JOSEPH'S COLLEGE (ARTS & SCIENCE)

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From the Chairman's Desk

Dear friends,

It is with great joy and happiness that I present this ***"International Conference on Smart Innovations and Artificial Intelligence for Sustainable Development"*** *organized by* ***St. Joseph Arts & Science College, Kovoor*** *- a unit of the* ***DMI Foundations.***

In a rapidly evolving world, Artificial Intelligence (AI) offers tremendous opportunities to transform daily life, healthcare, agriculture, education and environmental sustainability. AI is going to become in the near future as important and inevitable as the internet to humanity. However, these innovations must be guided and guarded by respect for human dignity, social responsibility and ethical values.

At St. Joseph's Kovoor, *we strongly believe that technology must basically serve human development, especially the development of the poor, needy and the marginalized. It must build a just, sustainable and inclusive society. I am happy that this conference organized by the college brings together researchers, scholars, innovators and scientists to find solutions to address global challenges with compassion and responsibility.*

I sincerely appreciate all the participants and organizers for your commitment to this important endeavour. May this conference inspire and ignite meaningful collaboration with lasting impact!

Best Wishes,

Rev. Fr. Dr. J.E. Arul Raj
Chairman, St. Joseph Arts & Science College, Kovoor
Chancellor, St. Joseph University of the DMI Foundations

Message from the Managing Trustee

With great joy and warm regards, I extend my heartfelt greetings to all the distinguished scholars, researchers, professionals, and delegates participating in the ***International Conference on Smart Innovations and Artificial Intelligence for Sustainable Development.***

In today's rapidly evolving world, technology has become a defining force in shaping the future of societies and economies. Among these advancements, Artificial Intelligence stands out as one of the most transformative developments of our time. When guided by ethical responsibility and visionary thinking, AI has the potential to improve lives, strengthen communities, and contribute significantly to sustainable development.

The purpose of this conference is not only to explore technological advancements but also to reflect on how these innovations can be used wisely to address global challenges. Issues such as environmental conservation, climate change, resource management, and social equity require solutions that combine scientific knowledge with innovative technological approaches.

Institutions of higher learning play a crucial role in fostering such innovation by encouraging research, creativity, and collaboration among scholars from diverse disciplines. By bringing together experts and emerging researchers under one platform, this conference creates an environment where ideas can flourish and partnerships can grow.

I would like to express my sincere appreciation to the organizing team, faculty members, and contributors who have worked with dedication to organize this important academic gathering. Their efforts demonstrate a shared commitment to advancing knowledge and promoting responsible innovation.

May this conference inspire meaningful dialogue, encourage groundbreaking research, and guide us toward solutions that support a more sustainable and technologically progressive world.

With my blessings and best wishes for the success of this conference.

Best Wishes,

Rev. Sr. Dr. S. Gnanaselvam

Managing Trustee

DFT Group of Institutions

Administrator's Message

Esteemed Scholars, Researchers, Innovators, and Participants,

It is my great pleasure to warmly welcome you all to the ***International Conference on Smart Innovations and Artificial Intelligence for Sustainable Development.*** *This conference serves as a dynamic platform that brings together visionary thinkers, academicians, industry experts, and emerging researchers who are united in their commitment to shaping a sustainable and technologically advanced future.*

In an era where innovation is rapidly transforming every aspect of our lives, such gatherings play a crucial role in fostering intellectual exchange, collaboration, and progressive thinking. Artificial Intelligence and smart technologies have emerged as powerful tools capable of addressing some of the most pressing global challenges. From enhancing resource efficiency and environmental sustainability to advancing healthcare, agriculture, and education, these technologies are enabling solutions that were once beyond imagination.

As we explore these advancements, it is equally important to ensure that technological progress aligns with the principles of sustainability, ethical responsibility, and inclusiveness. This conference provides an excellent opportunity to examine how smart innovations can contribute to sustainable development across diverse sectors. Through research presentations, insightful discussions, and interdisciplinary collaborations, participants will be able to exchange knowledge, gain new perspectives, and develop ideas that promote responsible and sustainable technological growth.

I sincerely commend the dedicated efforts of the organizing committee, faculty members, researchers, and volunteers whose commitment and hard work have made this conference possible. Their contributions reflect the spirit of academic excellence and innovation that our institution upholds. I extend my best wishes to all participants for productive discussions, meaningful collaborations, and successful outcomes. May this conference inspire innovative ideas and lasting partnerships that contribute to building a sustainable and technologically empowered world.

Best Wishes,

Rev. Sr. Dr. M. Baby

Administrator

St. Joseph's College (Arts & Science)

Kovur, Chennai 128

Principal's Message

"Sustainable development begins where innovation meets responsibility."

Dear Esteemed Scholars, Researchers, and Participants,

With the blessings of God Almighty and the visionary guidance of our Founder Chairman, Rev. Fr. Dr. J. E. Arul Raj, our institution continues to strive for excellence in education and holistic development. It is indeed a great privilege to convey my greetings on the International Conference on Smart Innovations and Artificial Intelligence for Sustainable Development, which reflects our commitment to promoting academic inquiry and meaningful research.

St. Joseph's College (Arts & Science) *has consistently worked towards creating an environment that nurtures intellectual growth, ethical values, and holistic development. Guided by our vision of forming individuals who are "Fully Alive and Fully Human," the institution remains dedicated to empowering students through quality education and social responsibility.*

The focus of this conference on smart innovations and artificial intelligence highlights the growing importance of technology in addressing contemporary global challenges. As advancements continue to influence various sectors, it is essential to ensure that such developments are aligned with the principles of sustainability, inclusiveness, and responsible progress.

This conference offers a valuable platform for scholars, researchers, and professionals to exchange ideas, present their work, and engage in meaningful academic dialogue. Such interactions contribute to the advancement of knowledge and encourage innovative approaches toward sustainable development.

I appreciate the dedicated efforts of the organizing team, faculty members, and all those who have contributed to making this conference possible. I extend my best wishes for the success of this conference and for all participants to have a productive and enriching experience.

Best Wishes,

Dr. R. Ruban

Principal
St. Joseph's College (Arts & Science)
Kovur, Chennai 128

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AI-DRIVEN CROP DISEASE DETECTION AND MANAGEMENT SYSTEM FOR SMART AGRICULTURE

Dr.R.RUBAN
Principal, St.Joseph's College (Arts & Science), Kovur, Chennai-128

Abstract:

Crop diseases present a major risk to agricultural efficiency and global food security, making early identification and effective management essential for sustainable farming. This paper proposes an Artificial Intelligence (AI)-based system for automated crop disease detection and management within a smart agriculture framework. The system utilizes advanced image processing and deep learning techniques, including Convolutional Neural Networks (CNNs) and transfer learning, to classify plant diseases from leaf images. High-resolution images captured via mobile devices or IoT-enabled sensors are analyzed to detect visual symptoms such as discoloration, spots, and lesions. The integration of Internet of Things (IoT) enables real-time data collection, while cloud computing supports scalable processing and decision-making. Upon detection, the system provides intelligent recommendations for treatment and prevention. The proposed approach enhances accuracy, efficiency, and scalability, ultimately improving crop yield, reducing economic losses, and promoting sustainable farming practices.

Keywords: *Smart Agriculture, Crop Disease Detection, CNN, Transfer Learning, IoT, Computer Vision, Precision Farming.*

THE ROLE OF ARTIFICIAL INTELLIGENCE IN SOCIAL WORK PRACTICE TOWARDS ACHIEVING THE SUSTAINABLE DEVELOPMENT GOALS

Dr. M. BABY
Assistant Professor, Department of Social Work, School of Science & Humanities,
St. Joseph University, Tamil Nadu

Abstract:

Social work is one of the many fields whose professional practices are changing as a result of the quick development of artificial intelligence (AI). In order to achieve the Sustainable Development Goals (SDGs) established by the UN under the 2030 Agenda for Sustainable Development, this article explores how AI might improve social work practice. The study examines how AI-driven technologies contribute to poverty reduction, enhanced health and well-being, high-quality education, gender equality, and decreased inequalities by analyzing recent academic works, policy documents, and international reports using a qualitative systematic literature review approach.

According to the research, AI technologies including data-driven policy tools, digital case management platforms, chatbots for mental health, and predictive analytics greatly improve early intervention techniques, resource allocation, and service delivery in social work practice. However, there are significant obstacles because of issues with algorithmic bias, data privacy, ethical responsibility, and digital exclusion. In order to promote responsible AI deployment, the study highlights the significance of incorporating ethical frameworks, professional values, and digital capabilities into social work education and practice. The article concludes that although AI cannot replace the human empathy and relational foundations inherent in social work, it can function as a potent supplementary tool to improve evidence-based interventions and foster sustainable, inclusive development in accordance with the Sustainable Development Goals.

Keywords: *Artificial Intelligence, Social Work Practice, Sustainable Development Goals, Digital Transformation, Ethical AI, Social Innovation.*

AI FOR CULTURAL AND SOCIAL EMPOWERMENT: DRIVING BEHAVIOUR CHANGE FOR SUSTAINABLE DEVELOPMENT

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Dr.T.MARIRAJAN,
Adjunct Professor, Department of Social work, St. Eugene University, Zambia

Abstract:

"You can take someone out of the country, but you cannot take the country out of someone" — human relationships are fundamentally shaped by socio-cultural identity. This study examines how Artificial Intelligence (AI) can preserve socio-cultural heritage, empower communities, and foster positive behaviour change for sustainable development in Ombella M'Poko, Bangui, Central African Republic, where local traditions and social norms strongly influence community behaviour and development outcomes.

Through AI tools—such as data analytics, predictive insights, and digital platforms—communities can document traditions, identify social challenges, and implement culturally sensitive interventions. Even in villages with limited infrastructure, mobile phones, SMS systems, offline AI applications, and community-based data collection provide actionable insights.

Aligned with SDG 11, Target 11.4, this study demonstrates AI's potential to safeguard cultural heritage, engage youth, and promote intergenerational transmission of socio-cultural values. It proposes a practical framework for evidence-based, culturally responsive strategies, showing how technology can work alongside culture to enhance social cohesion, resilience, and inclusion.

By highlighting AI's role in linking tradition with innovation, this research offers guidance for policymakers, practitioners, and community leaders seeking sustainable development approaches that respect and reinforce local cultural identity.

Keywords: *AI,Socio- Cultural heritage; Sustainable Development.*

ETHICS, VALUES, AND PHILOSOPHICAL FOUNDATIONS OF SUSTAINABLE DEVELOPMENT

M.J. MONICA AMALORPAVA JANANI

II MBA Student, Mother Teresa Womens University, Kodaikanal

Abstract:

Sustainable development is not merely a technical or economic challenge; it is fundamentally an ethical and philosophical endeavor rooted in values that shape human relationships with nature, society, and future generations. This paper examines the ethical principles, value systems, and philosophical foundations that underpin sustainable development, emphasizing the moral responsibility of humanity to pursue development pathways that are just, inclusive, and ecologically balanced. Drawing upon philosophical traditions such as environmental ethics, intergenerational justice, and human-centered development, the study highlights how ethical reasoning can guide decision-making beyond short-term economic gains.

The paper argues that sustainability requires a shift from anthropocentric worldviews toward more holistic and relational perspectives that recognize the intrinsic value of nature. It explores the role of cultural values, moral accountability, and social equity in addressing global challenges such as climate change, resource depletion, and socio-economic inequality. Furthermore, the discussion underscores the importance of ethical governance, participatory decision-making, and value-based education in fostering sustainable societies.

By integrating philosophical inquiry with contemporary sustainability discourse, this study contributes to a deeper understanding of how ethical frameworks can inform policy, institutional practices, and individual behavior. The paper concludes that sustainable development can only be meaningfully achieved when ethical values and philosophical reflection are placed at the core of development strategies, ensuring harmony between economic progress, social well-being, and environmental integrity.

Key words: *Moral Responsibility; Ecological Sustainability; Value-Based Governance; Human–Nature Relationship; Ethical Development; Future Generations.*

SUSTAINABLE DIGITAL PRACTICES AND GREEN CONSUMPTION: PERSPECTIVES OF EDUCATED YOUNG ADULTS

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Abstract:

As technological advancement accelerates alongside growing environmental challenges, the relationship between digital sustainability and environmentally responsible behaviour has become increasingly significant. This study examines the awareness, attitudes, and practices of educated youth regarding sustainable digital technologies and green purchasing decisions in the context of expanding digital access and internet usage. Based on secondary data from academic publications, government reports, environmental studies, and institutional sources, the research provides a comprehensive understanding of current sustainability trends and challenges. It explores key issues such as digital consumption patterns, awareness of e-waste, adoption of eco-friendly technologies, and the factors influencing sustainable purchasing behaviour, while also considering the role of cultural and educational backgrounds. The findings reveal that although environmental awareness among educated youth is generally positive, practical barriers such as cost, accessibility, limited resources, and gaps in sustainability-oriented digital literacy significantly affect decision-making, with price and availability often outweighing environmental concerns. The study underscores the importance of collaboration among educational institutions, non-governmental organizations, and government bodies to strengthen sustainability awareness and integrate it into educational frameworks. As digital natives and future leaders, educated youth possess strong potential to promote ethical digital practices and sustainable consumption, and empowering them to make informed, environmentally conscious choices within the digital economy can contribute to meaningful long-term ecological benefits despite ongoing structural and economic challenges.

Keywords: *Digital Sustainability, Green Consumerism, Educated Youth, Environmental Awareness, Sustainable Behavior.*

AN ANALYSIS OF CUSTOMER AWARENESS AND BUYING INTENTION TOWARDS ELECTRIC VEHICLES (EVS)

Ms. CHRISTINA. M

Head of the Department & Assistant Professor, Department of Business Administration,
St. Joseph's College (Arts & Science), Kovur, Chennai – 600 128

Abstract:

The increasing penetration rate of electric vehicles (EVs) is considered one of the most effective approaches for promoting sustainable transportation and reducing environmental burden. However, consumer acceptance remains a major challenge, especially in developing countries where concerns about cost, charging infrastructure, and reliability still influence purchasing decisions. In addition, perceived benefits have a significant positive impact on consumers' attitudes toward electric vehicles. Benefits such as lower operating costs, reduced greenhouse gas emissions, and government incentives can encourage consumers to consider. Attitude toward electric vehicles is identified as an important factor influencing purchase intention and is found to partially mediate the relationship between awareness and purchase intention. When consumers have a favorable attitude toward EVs, they are more likely to develop a strong intention to purchase them. This highlights the importance of shaping positive perceptions through education, marketing, and policy support. Public campaigns, demonstration projects, and improved access to reliable information can help reduce uncertainty and misconceptions. The study provides useful insights for electric vehicle manufacturers as well as policymakers by emphasizing the need to reduce the information gap and promote credibility in communication strategies. Strengthening awareness initiatives and highlighting the environmental and economic benefits of EVs can play a crucial role in accelerating their adoption.

Keywords: *Electric Vehicles, Penetration, Sustainable Transportation, Environment, Attitudes*. Purchase Intentions.

CIRCULAR BIOECONOMY INNOVATION: TRANSFORMING USED COOKING OIL INTO HIGH VALUE BIOSYNTHETIC DETERGENT PRECURSORS

DHAKSHAYINI A[1], Dr. N SUDHA[2]

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Abstract:

This review study addresses the dual challenge of petrochemical reliance in the detergent industry and the environmental hazards posed by improper disposal of used cooking oil (UCO), such as sewage blockages, health hazards and ecosystem contamination. By employing a circular bioeconomy model, the direct transformation of UCO into high-value Fatty Acid Methyl Esters (FAMEs) can be done. To bypass the energy inefficiencies and soap formation of traditional chemical catalysis, an enzymatic transesterification process is utilized. Under optimized, mild conditions (40°C and optimum pH), pretreated UCO reacts with methanol using the immobilized lipase *Candida antarctica B* (Novozym 435) as a high-performance biocatalyst. This reaction successfully yielded green FAME intermediates, which serves as the primary feedstock for biosynthetic detergents and surfactants through futher sulfonation into Methyl Ester Sulfonates (MES). Analytical quantification via Gas Chromatography confirmed a robust conversion efficiency exceeding 90%. Furthermore, the biocatalyst exhibited exceptional stability, maintaining over 85% of its initial catalytic activity across five consecutive reaction cycles. This sustainable methodology aligns with SDG 12 and 13, offering a scalable framework for Biotechnological Innovation for Environmental Sustainability and Public Health Preservation.

Keywords: *Immobilized lipase, Sustainable development, Used Cooking Oil (UCO), FAMEs, Bio-Based Detergent (MES), Circular Bioeconomy*.

BIOTECHNOLOGICAL INNOVATIONS FOR ENVIRONMENTAL SUSTAINABILITY AND PUBLIC HEALTH

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Abstract:

Environmental degradation and public health challenges are increasingly interconnected in the modern world. Air pollution, contaminated water, climate change, and unsustainable agricultural practices contribute significantly to disease burden and reduced quality of life. Biotechnology offers scientific and sustainable solutions by applying biological systems, microorganisms, and molecular techniques to environmental and medical problems. This paper examines major biotechnological innovations such as bio-remediation, wastewater treatment, renewable bio-energy, biodegradable materials, sustainable agriculture, vaccine development, and molecular diagnostics. It also discusses ethical and regulatory frameworks necessary for responsible application. Finally, the paper proposes strategic measures to strengthen the environmental sustainability aspects of biotechnology. The study concludes that responsible and well-regulated biotechnological innovation can promote ecological balance and long-term global health security.

Keywords: *Biotechnology, Environmental Sustainability, Public Health, Bio innovation, Sustainable Development.*

ECO-FRIENDLY SYNTHESIS OF SILVER NANOPARTICLES USING MORINGA OLEIFERA LEAF EXTRACT FOR REMOVAL OF ANTIBIOTIC CONTAMINANTS FROM HOSPITAL EFFLUENTS

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Abstract:

The occurrence of antibiotic residues in hospital wastewater has emerged as a significant environmental and public health issue, as these pollutants contribute to antimicrobial resistance and ecological harm. Traditional wastewater treatment systems often fall short in fully eliminating pharmaceutical substances, highlighting the need for sustainable and effective remediation methods. This research emphasizes the eco-friendly production of silver nanoparticles (AgNPs) using Moringa oleifera leaf extract and their use in eliminating antibiotic pollutants from hospital effluents. Moringa oleifera leaves are rich in bioactive compounds like flavonoids, phenolics, and proteins, which serve as natural reducing and stabilizing agents in the green synthesis of nanoparticles. In this method, the aqueous leaf extract converts silver ions into stable silver nanoparticles under controlled conditions. The produced AgNPs are analyzed using UV–Visible spectroscopy, Fourier Transform Infrared Spectroscopy (FTIR), and Scanning Electron Microscopy (SEM) to assess their formation, functional groups, and structure. These nanoparticles are then applied to hospital wastewater samples containing antibiotic residues such as tetracycline, ciprofloxacin, and amoxicillin. The effectiveness of AgNPs in breaking down or adsorbing these antibiotics is assessed by tracking concentration changes through spectrophotometric techniques. The findings are anticipated to demonstrate a significant reduction in antibiotic pollutants due to the surface area and catalytic properties of silver nanoparticles. This study underscores a sustainable nanobiotechnological approach utilizing plant-based resources for environmental cleanup. Silver nanoparticles mediated by Moringa oleifera present a cost-effective, eco-friendly solution for enhancing wastewater treatment and decreasing antibiotic pollution in aquatic environments.

Keywords: *Green synthesis, Hospital effluents, Antibiotic residues, Nano biotechnology*.

STRUCTURE-BASED COMPUTATIONAL ANALYSIS FOR THE IDENTIFICATION OF NOVEL DRUG TARGETS

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Abstract:

Generative Adversarial Networks (GANs) are Neural Networks that take random noise as input and generate outputs (e.g. a picture of a human face) that appear to be a sample from the distribution of the training set (e.g. set of other human faces). A GAN achieves this feat by training two models simultaneously. One model is called the generator, which generates new data instances; the other is called the discriminator, which evaluates whether generated instances are real or fake. The use of machine learning to generate art and images, including use of machine learning to generate art and images, including human faces, isa trending topic with many applications in our daily lives. Researchers have implemented various ideas, most of which are based on CNN or other tools. One of the main challenges in generating realistic human faces is removing all the noise and maximizing stabilization. In a recent paper, the authors proposed a generative adversarial network with two fully connected sequential models, one as a generator and another as a discriminator, to generate better real-life fake human faces with low computational power and without any external image classifier. The generator is trainable and creates fake human faces from random data, while the discriminator detects whether the images generated by the generator are fake or real and gives feedback to the generator. Based on the feedback, the generator improves its model and tries to generate more realistic images.

Keywords: *Generative adversarial network-fake human faces-generator-discriminator- celeba data set.*

ROLE OF RHIZOBIUM–LEGUME SYMBIOSIS IN SUSTAINABLE AGRICULTURAL SYSTEMS

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Abstract:

The partnership between Rhizobium bacteria and leguminous plants is crucial for fostering sustainable agriculture through the process of biological nitrogen fixation. Nitrogen is vital for plant growth and development, yet most plants are unable to directly use nitrogen from the atmosphere. Leguminous crops like soybeans, peas, chickpeas, and lentils form a symbiotic relationship with Rhizobium, which facilitates the transformation of atmospheric nitrogen (N_2) into ammonia (NH_3), a form that plants can easily absorb and utilize for their metabolic activities. This conversion takes place in specialized root structures known as nodules, where the bacteria reside and actively fix nitrogen with the help of the nitrogenase enzyme complex. The Rhizobium-legume interaction plays a significant role in enhancing soil fertility, decreasing reliance on synthetic nitrogen fertilizers, and boosting crop yields. Utilizing Rhizobium as a bio fertilizer has become an eco-friendly and cost-efficient approach to sustainable farming. By naturally increasing soil nitrogen levels, this symbiotic relationship supports plant growth while reducing environmental pollution from excessive chemical fertilizers. Beyond improving soil nutrient availability, the Rhizobium-legume association also enhances soil microbial diversity and maintains ecological balance in agricultural ecosystems. Crop rotation with leguminous plants further promotes long-term soil health and sustainable farming practices. Advances in microbial biotechnology and biofertilizer development are also enhancing the effectiveness of Rhizobium strains used in agriculture.

Keywords: *Legume–Rhizobium Symbiosis, Biological Nitrogen Fixation, Biofertilizers, Sustainable Agriculture*

ARTIFICIAL INTELLIGENCE–DRIVEN EARLY DETECTION OF ALZHEIMER'S DISEASE USING COGNITIVE AND BEHAVIOURAL DATA

VENNA MEENAKSHI REDDY[1], Dr. ATULBABU G[2]

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Abstract:

Artificial Intelligence is playing an increasingly pivotal role in revolutionizing modern healthcare by facilitating early diagnosis and enhancing disease management. Alzheimer's Disease, a significant neurological disorder impacting the elderly, is a progressive ailment that results in memory deterioration, cognitive impairment, and behavioral alterations. Detecting this disease at an early stage is essential for timely intervention and improved patient care. This study introduces an AI-driven method for the early detection of Alzheimer's disease through the analysis of cognitive and behavioral data. The research emphasizes examining patterns in memory function, speech traits, daily activity behaviors, and other cognitive markers that might indicate early neurological decline. Machine learning algorithms are utilized to uncover hidden connections within the gathered data and to categorize individuals who may be at risk. The proposed method is designed to aid healthcare professionals by offering a decision-support system that can identify subtle cognitive changes before severe symptoms manifest. By combining computational techniques with clinical insights, the system aims to enhance diagnostic precision and assist in tracking disease progression. The study underscores the potential of AI technologies to improve early screening methods for neurodegenerative diseases. Implementing such intelligent systems can lead to better healthcare outcomes, prompt medical intervention, and an improved quality of life for patients with Alzheimer's disease.

Keywords: *Artificial Intelligence, Alzheimer's Disease, Early Detection, Cognitive Data, Behavioral Analysis, Healthcare Analytics*

ARTIFICIAL INTELLIGENCE FOR SUSTAINABLE RURAL DEVELOPMENT: OPPORTUNITIES FOR WOMEN SHGS

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[2]Assistant Professor, Depart of Social Work, School of Science & Humanities, St. Joseph University, Tamil Nadu.

Abstract:

Artificial Intelligence (AI) is rapidly emerging as a transformative force with significant potential to accelerate sustainable rural development, particularly by strengthening the socio-economic empowerment of women through Self-Help Groups (SHGs). Women-led SHGs play a crucial role in poverty alleviation, livelihood generation, financial inclusion, and community advancement in rural areas. Integrating AI-driven solutions into SHG activities can substantially enhance decision-making, productivity, and market access while promoting inclusive and sustainable growth. AI technologies—such as digital financial platforms, data analytics, machine learning applications, mobile-based monitoring systems, and intelligent supply chain management tools—can provide real-time market insights, enable tailored financial services (including credit scoring and risk assessment), and improve financial planning through predictive analytics. By addressing barriers related to limited mobility, restricted access to information, and knowledge gaps, AI-enabled digital platforms can foster rural women's entrepreneurship, enhance skill development, and strengthen institutional capacity within SHGs. Furthermore, AI contributes to environmental sustainability by improving resource efficiency, reducing waste, supporting climate-resilient agricultural practices, and enabling data-driven rural planning. However, challenges such as the digital divide, data privacy concerns, affordability constraints, limited digital literacy, and the need for gender-sensitive AI design must be addressed to ensure equitable access and impact. With appropriate policy frameworks, investment in digital infrastructure, and targeted capacity-building initiatives, AI can serve as a powerful catalyst for sustainable rural development and women-led economic empowerment through SHGs.

Keywords: *Artificial Intelligence, Self-Help Groups (SHGs), Sustainable Rural Development, Climate-Resilient Livelihoods.*

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FROM ENGAGEMENT TO DISTRACTION: SOCIAL MEDIA ENTERTAINMENT AND ACADEMIC PERFORMANCE AMONG GEN Z STUDENTS

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Assistant Professor SDNB Vaishnav College for Women Chrompet, Chennai.
B.Com Student, Department of Professional Accounting, SDNB Vaishnav College for Women Chrompet, Chenna

Abstract:

This article discusses the impact of social media entertainment consumption on the academic performance of Generation Z students. The rise of entertainment celebrities on channels such as Instagram, YouTube and short video apps have turned social media into one of the significant components of the students' daily life. On the one hand, these platforms provide fashionable, eye-catching, interactive content which boosts users' engagement and on the other hand, overusing these platforms can cause a loss of academic focus and negatively affect the learning outcome. The research investigates the effects of students listening to entertainment, driven by social media content for a long time on their study habits, attention span, and overall academic performance. Studies using survey methods show a strong correlation between high levels of engagement with entertainment content and increased distraction, reduction of concentration and decreased academic results. It is also found that short-form and highly engaging content leads to a decrease in students' attention span, which eventually results in difficulty maintaining concentration during academic tasks. Nevertheless, the relatively small amount and point of social media usage may bring about some advantages if accompanied by the good use of time. Gen Z students need to develop their digital awareness, self, regulation, and mindful social media usage, according to the study, to limit distractions and achieve academic success.

Keywords: *Social Media Usage, Academic Engagement, Concentration Ability, Screen Exposure, Learning Outcome.*

SUSTAINABLE MARKETING AND CONSUMER RESPONSE A CONCEPTUAL OVERVIEW

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Abstract:

The increasing environmental concerns, climate change issues, and rising consumer awareness have significantly influenced the evolution of marketing practices toward sustainability. Sustainable marketing goes beyond traditional promotional strategies by integrating environmental responsibility, social equity, and economic viability into core business operations. The present paper titled "**Sustainable Marketing and Consumer Response – A Conceptual Overview"** aims to examine the theoretical foundations and key dimensions of sustainable marketing, along with understanding how consumers respond to such initiatives. This study adopts a descriptive and conceptual methodology based entirely on secondary data drawn from scholarly articles, books, reports, and existing literature. It explores major components of sustainable marketing, including green product development, ethical pricing, sustainable packaging, responsible communication, and corporate social responsibility. The paper further discusses consumer response in terms of attitudes, trust, perception, purchase intention, and loyalty toward sustainable brands. The review also highlights the attitude–behavior gap, where positive environmental attitudes do not always translate into actual purchasing decisions. Factors such as environmental awareness, perceived credibility, transparency, cultural values, and skepticism toward greenwashing are examined as influential determinants of consumer behavior. By synthesizing existing literature, this conceptual overview provides insights into the relationship between sustainable marketing strategies and consumer response. The study offers a foundation for future empirical research and supports marketers and policymakers in aligning sustainability initiatives with evolving consumer expectations for long-term value creation.

Keywords: *Sustainable Marketing, Consumer Response, Green Marketing, Consumer Behavior, Corporate Social Responsibility, Sustainability.*

TRADE PRACTICES OF GREEN MARKETING IN SUSTAINABLE DEVELOPMENT: ITS IMPACT AND CHALLENGES

D.JEEVITHA

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Abstract:

The green revolution, going green, saving the environment, leading a sustainable lifestyle, sustainable development, safeguarding the environment, and many other concepts have become commonplace in our daily lives. Many businesses across a range of industries utilize green marketing as a technique to keep up with this trend. There has been a great deal of research on green marketing over the years; this paper uses a thorough literature review to analyze how green marketing tactics affect consumer happiness and environmental safety. Therefore, researchers who need to determine how green marketing affects consumer satisfaction and environmental safety might use this work. Green marketing has become increasingly important in today's market. It has allowed companies to re-market and package existing products that already meet certain environmental standards. Furthermore, green marketing has created opportunities for companies to co-brand their products into separate lines, highlighting the eco-friendliness of some while overlooking the impact of others. These marketing techniques are a direct result of changing consumer attitudes. Consequently, businesses have intensified their efforts to target environmentally conscious consumers. This paper identifies specific segments of green consumers and examines the challenges and opportunities businesses face with green marketing. Green marketing encompasses a wide spectrum of actions, such as altering products, modifying production methods, redesigning packaging, and adjusting advertising strategies. Companies engage in green marketing to tackle concerns related to expenses or profitability. Consumers, businesses, and the government all have crucial roles in the execution of green marketing initiatives. However, the process faces several limitations, including insufficient consumer understanding, financial limitations, and a lack of extensive scientific knowledge, inadequate regulations, and competitive market forces.

Keywords*: Green Product, Recyclable, Eco Friendly, Sustainable Development, Corporate Social Responsibility.*

SMART TECHNOLOGIES FOR SOLAR, WIND AND HYBRID RENEWABLE ENERGY SYSTEM

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Abstract:

Smart Technologies for Solar, Wind, and Hybrid Renewable Energy Systems The rapid growth of renewable energy has increased the adoption of solar and wind power systems to meet global energy demands sustainably. However, the intermittent nature of these resources creates challenges in efficiency, reliability, and grid integration. Smart technologies provide effective solutions by enabling intelligent monitoring, control, and optimization of renewable energy systems. This paper highlights the application of Internet of Things (IoT), advanced sensors, artificial intelligence, and machine learning techniques for real-time performance monitoring, power forecasting, fault detection, and adaptive control. The integration of smart power electronics and energy storage systems enhances system efficiency, power quality, and grid stability. Hybrid renewable energy systems combining solar and wind resources are emphasized for their complementary nature and improved reliability. The study demonstrates that smart and hybrid renewable energy systems play a crucial role in reducing carbon emissions, improving energy security, and supporting sustainable development.

Keywords*: Smart Technologies, Solar Energy, Wind Energy, Hybrid Renewable Systems*.

UNDERSTANDING TRANSPORTATION MODE SELECTION AMONG URBAN COMMUTERS: A SURVEY STUDY

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Abstract:

Growing urbanization in metropolitan cities leads the high demand in transportation, increasing the traffic congestion, creating the environmental pollution, and bringing the travel discomfort. Understanding the commuters who are residing in the urban cities transportation selection among existing transportation options such as private vehicles, public transport, cycling, walking, and shared mobility services become crucial parameters for developing sustainable and efficient transportation system in urban cities. This survey examines commuters' transportation mode selection behavior by analysing the various arguments like socio-demographic status, economic status, infrastructural availability, financial constraints, security, service frequency, easiness and Psychological factors. The above said arguments only influence travel decisions. This paper completely reviews and synthesizes results from existing survey-based papers, underscoring the prevailing patterns and emerging trends in urban mobility. Apart from that, this paper discusses commonly used analytical approaches for modelling commuter choice behavior and reveals the implications of those insights for transportation planning and policy finalization. The study insisting the role of informed, behavior-oriented strategies in helping sustainable urban mobility and developing the overall performance of transportation system.

Keywords: *Commuter behaviour, Transportation mode choice, Urban mobility, Public transit systems, Travel behaviour analysis, Sustainable transportations.*

DESIGNING AUTOMATED CI/CD-ENABLED MACHINE LEARNING PIPELINES FOR SCALABLE PRODUCTION SYSTEMS

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Abstract:

The rapid adoption of Machine Learning (ML) systems in production environments has become a critical challenge in scalability, reproducibility, and deployment reliability. Unlike traditional software systems, ML applications involve complex dependencies among code, data, models, and infrastructure, making manual deployment processes inefficient and error-prone. This study suggests a scalable architecture for creating automated machine learning pipelines that are supported by continuous integration and deployment (CI/CD) and are suited for production-grade solutions. The proposed framework integrates automated model training, data validation, version control, testing, containerization, and deployment using modern MLOps tools such as Kubeflow, MLflow, and orchestration platforms like Kubernetes. The architecture incorporates automated performance validation thresholds, model registry management, blue-green and canary deployment strategies, and continuous monitoring mechanisms for drift detection and retraining triggers. An experimental evaluation compares manual ML deployment workflows with the proposed automated CI/CD-integrated pipeline using metrics such as deployment time, model reproducibility, system latency, failure recovery time, and scalability under variable workloads. Results demonstrate significant improvements in deployment frequency, reduced operational risk, enhanced fault tolerance, and improved lifecycle management efficiency. This research contributes a structured framework for implementing robust, production-ready ML systems and provides practical guidelines for organizations transitioning toward scalable MLOps practices. The findings highlight the importance of integrating DevOps principles into ML engineering to enable reliable, automated, and continuously improving intelligent systems.

Keywords: *Machine Learning Operations (MLOps), CI/CD, Automated ML Pipelines, Scalable Production Systems, Model Registry, Drift Detection, Containerized Deployment.*

FROM DATA PIPELINES TO INTELLIGENT SYSTEMS: ENHANCING DATA PIPELINES WITH GENERATIVE INTELLIGENCE

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Abstract:

Conventional data pipelines are mainly utilized for data fetching, processing, and analytics, which lacks intelligent functionalities beyond descriptive analytics. However, the increasing momentum of Generative Artificial Intelligence brings a vast opportunity for the conversion of these conventional data pipelines from dumb pipes to intelligent pipes, enabling reasoning, inference, and decision making. This manuscript describes the extended applicability of the emerging aspect of Generative Intelligence in infusing data pipelines with intelligent functionalities for intelligent data processing, intelligent data cleaning, intelligent simulation, scenario simulation, and natural language processing-based insight interpretation. Moreover, this manuscript briefs the applicability of this approach in various sectors, namely finance, manufacturing, healthcare, along with some of the prevailing challenges in the context of this approach, especially in terms of its ethics, trustability, and methodologies. This research presentation clearly identifies the applicability of Generative Intelligence as an enabling or intermediary technology that can bridge the gap between data and intelligence.

Keywords: *Generative Artificial Intelligence, Data Pipelines, Intelligent Data Processing, Automated Insight Generation, Scenario Simulation, Decision Support Systems, Data to Intelligence.*

A COMPREHENSIVE REVIEW OF LIGHTWEIGHT ATTENTION GUIDED CNN MODELS FOR EARLY PANCREATIC CANCER DETECTION USING CT IMAGING

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Abstract:

Pancreatic cancer remains one of the most lethal malignancies worldwide due to its asymptomatic progression and late-stage diagnosis. Early detection through contrast-enhanced computed tomography (CT) imaging plays a critical role in improving survival rates; however, subtle tumor characteristics and anatomical complexity make automated diagnosis highly challenging. In recent years, deep learning—particularly convolutional neural networks (CNNs)—has demonstrated significant potential in medical image analysis. Nevertheless, many existing CNN-based approaches suffer from high computational complexity, limited sensitivity to small or early-stage lesions, and reduced generalization across heterogeneous datasets.

This review provides a comprehensive analysis of lightweight attention-guided CNN models developed for early pancreatic cancer detection using CT imaging. The study systematically examines architectural innovations such as depthwise separable convolutions, squeeze-and-excitation mechanisms, channel–spatial attention modules, adaptive loss functions, and lesion-focused preprocessing strategies. Comparative evaluation of recent literature highlights performance trends, computational efficiency, dataset limitations, and clinical applicability. Furthermore, this review identifies key challenges including data scarcity, class imbalance, overfitting, explainability, and real-time deployment constraints. Finally, potential future research directions are discussed, including transformer integration, multimodal fusion, 3D lightweight architectures, and explainable AI techniques for improved clinical adoption.

The findings of this review aim to guide researchers in developing computationally efficient and clinically reliable deep learning frameworks for early pancreatic cancer diagnosis.

Keywords: *Pancreatic Cancer, CNN, Attention Mechanism, Medical Imaging, Early Detection.*

ENHANCING BANKING OPERATIONS THROUGH BLOCKCHAIN SMART CONTRACTS

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Abstract:

In recent years, the banking industry has undergone significant technological evolution driven by digital services, online payments, and global financial connectivity. As transaction volumes increase and customer expectations rise, financial institutions are seeking systems that offer greater efficiency, transparency, and security. Conventional banking frameworks, largely dependent on centralized databases and manual verification procedures, often face challenges such as operational delays, higher administrative costs, and exposure to fraud risks. Blockchain technology provides an alternative model through its decentralized and tamper-resistant ledger structure, with smart contracts emerging as one of its most impactful innovations.

This paper examines how blockchain-based smart contracts can strengthen banking operations by automating financial agreements and embedding predefined rules directly into digital transaction systems. These self-executing contracts minimize reliance on intermediaries and reduce human intervention in processes such as loan disbursement, trade finance, payment settlements, and compliance verification. The immutable and cryptographically secured nature of blockchain ensures that once a transaction is validated, it cannot be altered, thereby enhancing trust and accountability.

By combining automation with decentralized security, blockchain-enabled smart contracts offer a practical pathway toward more resilient, transparent, and efficient banking systems.

Keywords: *Blockchain, Smart Contracts, Banking Operations, Decentralized Ledger, Financial Transactions, Digital Banking.*

IMPLEMENTATION OF SMART INVENTORY MANAGEMENT SYSTEM FOR WASTE REDUCTION IN INDIAN FIVE-STAR LUXURY HOTELS

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Abstract:

Waste generation has significantly increased as a result of India's hospitality industry's rapid growth, especially at five-star luxury hotels where vast buffet systems, high service standards, and bulk purchase techniques frequently lead to excessive food waste. Among the main causes of waste production in upscale hotel kitchens are ineffective inventory control, excessive stockpiling of perishable goods, imprecise demand projections, and a lack of real-time food supply monitoring. In addition to raising operational expenses for hotel management, this causes environmental issues such landfill accumulation and elevated carbon emissions. Many Indian luxury hotels still struggle to reduce food wastage despite the implementation of numerous sustainability programs because they lack sophisticated inventory control systems.

The adoption of Smart Inventory Management Systems (SIMS) as a successful waste reduction tactic in five-star hotels in India is the main topic of this study. Through the use of demand forecasting methodologies, real-time data analytics, and automated stock tracking, SIMS may help hotel management minimize overstocking, improve procurement procedures, and lessen perishable goods spoilage. Without sacrificing service quality, the use of such systems can greatly reduce food waste generation, increase operating efficiency, and improve inventory accuracy. The purpose of the study is to assess how well intelligent inventory management techniques may cut down on food waste and encourage sustainable resource use in the upscale hospitality industry. It is anticipated that the results will help Indian five-star hotels implement more economical and ecologically friendly waste management procedures.

Keywords: *Smart Inventory Management System, Food Waste Reduction, Luxury Hotels, Demand Forecasting, Sustainable Hospitality.*

COMPARATIVE OPINION MINING AND ASPECT-BASED SENTIMENT ANALYSIS FOR PRODUCT RANKING UTILIZING WEIGHTED AGGREGATION

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Abstract:

As e-commerce platforms expand rapidly, customer reviews are becoming a crucial source of information for decision-making. Traditional sentiment analysis provides polarity at the document level but fails to reveal preferences at the feature level or offer comparative insights. This study introduces a comparative opinion mining approach that combines weighted ranking with aspect-based sentiment analysis for product assessment. To evaluate competing products, the system extracts features, calculates sentiment scores, identifies comparative preferences, and aggregates weighted scores. An experimental study using smartphone review data shows that combining weighted aspect aggregation with comparison mining enhances ranking reliability and aids businesses in decision-making.

Keywords: *Opinion Mining, Sentiment Analysis, Product assessment, Weighted Scoring, decision-making.*

ADAPTIVE EXPLAINABLE GRAPH–ENSEMBLE DEEP LEARNING FRAMEWORK FOR REAL-TIME FINANCIAL FRAUD DETECTION

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Abstract:
The rapid growth of banking and mobile payments has made financial fraud a big issue. In recent studies in places like IEEE Access and Expert Systems with Applications have shown that machine learning can help to find fraud.There are still some issues that are hard to solve in the situations when there is not much data and fraud methods are frequently changing.

This study is about a system called Adaptive Explainable Graph-Ensemble Deep Learning Framework. This system uses graph networks to observe how transactions are related and deep autoencoders to look for anomalies. It also uses gradient boosting ensembles to look at features. The system can handle data that is not balanced and it can even stop attacks from fraud people.

The system is designed to be transparent and it explains how decisions can be made, which can help people trust it and follow the rules. When we tested the system on a dataset it worked very well. It was better than systems at finding fraud and it did not make many mistakes.

The Adaptive Explainable Graph-Ensemble Deep Learning Framework is a solution for digital banking and fintech platforms. It uses graph analytics, ensemble learning and explainable artificial intelligence to stop fraud. This study provides a system that can help both researchers and industrialists to use it in their life. The system can be used for banking, fintech platforms and anti-money laundering systems.

Keywords: *Financial Fraud Detection, Explainable Artificial Intelligence (XAI),Graph-Ensemble Deep Learning.*

SUSTAINABLE BIOPLASTIC PRODUCTION FROM BANANA PEEL WASTE USING MIXED MICROBIAL FERMENTATION

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Abstract:

Plastic pollution is a major environmental problem caused by the extensive use of non-biodegradable petroleum-based plastics. Developing sustainable and eco-friendly alternatives is therefore important. This study focuses on the production of biodegradable bioplastic from banana peel waste using mixed microbial fermentation and the evaluation of its biodegradability. Banana peels, which are rich in carbohydrates, were used as a low-cost substrate. The peels were pretreated and hydrolyzed to obtain fermentable sugars, which served as a carbon source for microbial cultures. During fermentation, microorganisms converted these sugars into polyhydroxyalkanoates (PHAs), a biodegradable polymer with thermoplastic properties. The produced bioplastic was extracted and analyzed using physicochemical and structural methods. The results confirmed the presence of PHA and showed suitable properties for potential material applications. Biodegradability was tested using soil burial methods, which showed significant degradation compared to conventional plastics. This study demonstrates that banana peel waste can be effectively converted into biodegradable plastic, providing a sustainable solution to reduce plastic pollution and promote eco-friendly packaging materials.

Keywords: *Bioplastic, Banana peel waste, Mixed microbial fermentation, Polyhydroxyalkanoates, Biodegradability.*

INTEGRATED SMART SOLUTIONS IN HOSPITALITY AND TOURISM FOR SUSTAINABLE DEVELOPMENT

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Abstract:

India is rich in art, culture, and a vast historical heritage, making it one of the world's prominent tourism destinations. According to a report from NITI Aayog, India's tourism is facing a severe crisis regarding waste management. Due to unhygienic reasons like poor sanitation, untidy surroundings, and accommodation, which may lead to serious infections and diseases. Many foreign visitors also reported hygiene and sanitation as the major problem. Many are not ready to return to India because, according to a survey, 46.3% have experienced diarrhea, and it is suggested that improving hygiene standards may enhance tourism in India.

Tourism plays an important role in influencing national image and economic growth. Since tourism contributes nearly 6% of the national GDP, this issue cannot be overlooked. To overcome these challenges, the paper discusses about smart technological interventions, including IoT-based waste detection systems and sensor-enabled smart bins. Also, turning waste management into resources like biofuel and manure, and implementing incentive-based waste disposal in terms of recycling. For better communication, train staff with basic spoken English or incorporate guides who know English, which helps to offer better services. As a whole, these measures help in improving sanitation and tourist experiences; they also aid in marking India as a must-visit tourism spot.

Keywords: *IoT devices, Smart bins, Waste Management, Tourism, GDP.*

BIG DATA FOR ENVIRONMENTAL SUSTAINABILITY

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Abstract:

Environmental sustainability has become a critical global concern due to increasing pollution, climate change. With the rise in pollution, climate change, and excessive exploitation of natural resources, environmental sustainability has become a pressing global issue. Conventional environmental monitoring techniques often fall short in terms of speed and scope, making it challenging to effectively respond to rapidly changing ecological conditions. This study investigates the role of big data analytics in bolstering environmental sustainability by facilitating the efficient gathering, integration, and examination of extensive environmental data from various sources. These sources include satellite images, IoT-based sensors for assessing air and water quality, climate monitoring systems, smart energy meters, and geospatial data platforms. Additionally, the system enhances resource management by uncovering patterns and trends that might be overlooked by traditional analysis methods. The results indicate that big data-driven environmental monitoring improves sustainability planning, enhances disaster readiness, and aids in making informed decisions for conservation and resource management. Moreover, this data-focused approach allows proactive environmental management by forecasting potential threats, such as floods, deforestation, and air quality decline, before they develop into significant problems. In summary, integrating Big Data analytics into environmental systems offers a robust tool for converting complex ecological data into actionable insights, promoting long-term sustainability, ecological balance, and climate-resilient development.

Keywords: *Big Data Analytics, Environmental Sustainability, Predictive Modelling, Machine Learning, Pollution Forecasting, Resource Management, Climate Change Analysis, IoT Sensors.*

A COMPARATIVE STUDY OF SUPERVISED AND UNSUPERVISED METHODS FOR SENTIMENT ANALYSIS AT THE DOCUMENT LEVEL

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Abstract:

The goal of global-level view mining which is familiar in digital forum analytics and user audit inquiry is to determine the all-inclusive tone of a narrative given the exponential growth of digital content data selecting a suitable analytical approach is crucial to achieving accurate emotion categorization this study compares the efficacy efficiency and real-world implementation of oversight and empowered techniques for record-level text analysis the learned approaches that have been investigated include standard cognitive computing techniques such as support vector machines svm naive bayes and logistic regression which generate discriminative sentiment features using labeled datasets conversely unlabeled data approaches do not need annotated data and instead infer opinion orientation using dictionary-based methods tokenization stop-word removal stemming and tf-idf feature extraction are all part of a consistent preprocessing pipeline that is used to ensure fair comparisons between models experiments on benchmark datasets demonstrate that labelled data models achieve higher stratification accuracy when there is an adequate amount of trained data available while unlabeled approaches perform worse in low-cost sequence of events due to their independence from supervised corpora and lower implementation costs this study assists practitioners in selecting the optimal survey analysis methods based on the needs of their utilization and the data availability by illuminating the trade-offs between classification accuracy and data dependency

Keywords: *Supervised learning, Unsupervised learning, Dictionary-based methods, Text preprocessing, Feature extraction.*

THE IMPACT OF ARTIFICIAL INTELLIGENCE ON EDUCATION IN INDIA

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Abstract:

Artificial Intelligence (AI) has been rapidly changing the education sector in India by enhancing the ways of teaching, learning processes of students and management of institutions. This paper will discuss how AI technologies (personalized learning systems, virtual assistants, automated assessments, and smart campus solutions) can be used to develop data-driven and learner-centered learning. Artificial intelligence is used to interpret the performance of students to offer them personalized learning resources, ongoing feedback, and adaptive learning options, and measures such as NEP 2020 promote digital learning and development of AI skills. Among the main advantages listed in the paper are personalized learning, effective assessment, and enhanced curriculum development, whereas such issues as data privacy, digital inequality, limitations in infrastructure, and the necessity to retain human interaction are also mentioned. The paper concludes that AI must serve as an assistance to teachers, and it will help achieve a sustainable, adaptive, and inclusive future of the Indian education system.

Keywords: *Artificial Intelligence, Personalized Learning, Digital Education, Smart Learning Systems*

SUSTAINABLE AI BASED FRAMEWORK FOR PERSONALIZED DRUG RESPONSE PREDICTION IN CLINICAL DATA

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Abstract:

Variability in patient response to the same medication continues to challenge modern healthcare systems worldwide. This uncertainty often leads to ineffective treatment, avoidable side effects, and increased healthcare costs. Improving early prediction of drug response is therefore important for advancing personalized medicine and building more sustainable healthcare systems. However, many existing studies rely on complex clinical inputs or overlook the predictive value of routinely available patient features.

In this study, we propose a machine learning based framework to predict patient specific drug response using structured clinical and demographic attributes. Experiments are conducted on the Heart Disease dataset from the UCI Machine Learning Repository, representing a United States clinical context. The dataset contains 303 patient records collected from retrospective observations in the late twentieth century. For this proof of concept, the target variable is engineered to simulate drug response, with about 45 percent labeled as non-responders.

We compare Logistic Regression, Random Forest, and XGBoost using standard preprocessing and cross validation. Results show that XGBoost performs best overall, while Random Forest remains stable. The findings highlight the potential of sustainable AI to support early personalized treatment decisions. The proposed framework is simple, scalable, and suitable for integration into real clinical decision support workflows.

Keywords: *Sustainable AI, Personalized Medicine, Drug Response Prediction, Machine Learning.*

PERFORMANCE ANALYSIS OF SEARCH ALGORITHMS USING PRIMARY KEY INDEXING IN EMPLOYEE DATABASES

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Abstract:

Efficient and accurate data retrieval is essential for managing large institutional databases, particularly in academic and administrative contexts. This research investigates the performance of Linear Search and Binary Search algorithms using Employee_ID as the primary key in a database comprising 3000 employee records from Chennai City Colleges. The study follows a hierarchical experimental methodology, encompassing data collection, preprocessing, algorithm implementation, repeated performance testing, statistical analysis and graphical visualization. Results demonstrate that Binary Search significantly outperforms Linear Search, with a mean execution time of 0.00051 seconds compared to 0.0164 seconds, making Binary Search approximately 32 times faster. These results correspond with theoretical algorithmic complexities, with Linear Search showing $O(n)$) and Binary Search $O(\log n)$ behavior. The findings emphasize the importance of sorted primary keys and structured indexing, offering practical insights for applying B-Tree and $B+$ Tree indexing in large organizational databases.

Keywords: *Linear Search, Binary Search, Primary Key,* $B-$Tree , $B+$ Tree , *Database Performance.*

JOBS SKILLS GAP – AI ANALYZER

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Abstract:

The swift changes in labour markets have led to a mismatch between candidate skills and industry needs. Finding these skill gaps by hand can take a lot of time and may not be very accurate. This paper introduces an AI-Powered Job Skills Gap Analyzer, a full-stack web application that examines resumes and job descriptions to detect skill mismatches. The system employs Natural Language Processing (NLP) techniques including text extraction, keyword extraction, Named Entity Recognition (NER), and semantic similarity analysis to identify relevant skills. The skills that are taken out are checked against what the job needs and then put into three groups: those that match, those that are not there, and those that are extra. Based on the analysis, the system offers personalized recommendations such as courses, certifications, and projects to help users enhance their skills. A lively dashboard also shows information about how skills are spread out and how careers develop over time.

Keywords: *Artificial Intelligence (AI), Skill Gap Analysis, Natural Language Processing (NLP), Named Entity Recognition (NER), Resume–Job Description Matching, Personalised Learning Recommendation,*

SYSTEMATIC REVIEW OF ARTIFICIAL INTELLIGENCE APPROACHES FOR CORONARY ARTERY DISEASE RISK STRATIFICATION

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Abstract:

Coronary Artery Disease is a condition where the coronary arteries become narrowed or blocked due to fatty deposits. Myocardial Ischemia and Myocardial Infarction represent two critical manifestations within the spectrum of Coronary Artery Disease. While Ischemia reflects insufficient blood supply to the heart muscle, infarction occurs when this shortage becomes prolonged or complete, leading to irreversible tissue damage. Both conditions carry significant risks for morbidity and mortality, underscoring the importance of early prediction, accurate diagnosis, and timely intervention in the management of ischemic heart disease. Machine learning, Deep learning, and Hybrid approaches are increasingly recognized as valuable innovations for advancing the diagnosis and management of ischemic heart disease. The systematic Review provides an overview of 15 peer-reviewed journals published between 2019 and 2025 that address the different approaches for predicting Coronary Artery Disease using Machine Learning and Deep Learning paradigms. This review presents a comparative assessment of machine learning and deep learning techniques for predicting myocardial infarction (MI) and myocardial ischemia. Evidence shows that hybrid stacking strategies, particularly those leveraging ECG data, achieve the highest diagnostic performance. Reported accuracies ranged from 95–97%, with corresponding improvements in precision, recall, and F1-score. These outcomes suggest that hybrid models may provide the most practical pathway for clinical deployment.

Keywords: *Coronary Artery Disease, Myocardial Ischemia, Myocardial Infarction, Machine Learning, Deep Learning, Hybrid Model.*

ADVANCES IN WEARABLE SENSOR TECHNOLOGY FOR MONITORING AND DIAGNOSING CARDIOVASCULAR DISEASES

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Abstract:
Wearable sensors have become a revolutionary tool in helping improve the delivery of healthcare especially concerning cardiovascular disorders. While cardiovascular diseases remain to be the major killers globally, the need for new and effective diagnostic solutions is now more important than ever. This paper aims to describe the development of wearable sensors in cardiovascular monitoring providing the information on the interaction of such technologies with the clinical practice. Wearable sensors form the paper's background information regarding the technological aspect, this includes; A master system model with small-sized hardware components, increased battery endurance and higher level of data precision. These developments have allowed the constant and fast monitoring without interferences of physiological characteristics, like the heart rate, blood pressure, and electrocardiogram signals. The advancement and combination of artificial intelligence and machine learning systems in Wearable technologies have contributed towards optimum diagnosis and customized treatment of cardiovascular diseases. Some of the newly conducted experimental results are being highlighted, proving the potential of wearable sensors for real-time tracking and risk evaluation. The paper also describes the problems that relate to the application of these technologies such as privacy concerns, the problem of compliance and the requirement of standardization. Also, the effectiveness of wearable sensors in case of prospective decrease of the health care costs and enhancement of patients' quality of life is considered. Hence, the paper fits into the existing literature by giving an extensive elaboration on wearable sensor systems in relation to cardiovascular disease. They specify the direction for further research in this field, such as the creation of more complex patterns for data analysis, the connection of the multimodal sensors, and the investigation of the other applications apart from the cardiovascular ones. The implication that lies in this paper is that, further research, and innovation in extending cooperation between health care practitioners, engineers and data scientists is required to move wearable sensor technology to the next level of health care improvement especially in cardiovascular system.
Keywords: *Wearable sensor technology, cardiovascular ailments, real-time tracking, artificial neural network-based systems, healthcare advancements, non/minimum invasiveness diagnostics.*

FAST HEART DISEASE DETECTION USING WINOGRAD TRANSFORM WITH ECG SIGNALS AND CHEST X-RAY IMAGES

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Abstract:

Heart problems are still a major reason people die globally, showing how crucial it is to have quick and precise ways to diagnose them. This study introduces a speedy system for finding heart disease that combines electrocardiogram (ECG) signals with chest X-ray pictures. It uses the Winograd Transform to make deep learning models work faster. The approach uses cutting-edge signal processing and medical image analysis to pull out important details from ECG readings and X-ray images. The Winograd Transform speeds up the math in convolutional neural networks (CNNs), which means quicker processing without losing accuracy in diagnosis. The system looks at both the electrical activity from ECGs and the structural clues from chest X-rays, allowing for more dependable identification of heart issues. Tests show that this new model is faster and more accurate than older methods that rely on standard convolution. This setup can help doctors diagnose conditions early and make decisions on the spot, especially in places where healthcare resources are limited. By combining smart deep learning with different types of medical data, it helps build intelligent and adaptable computer systems for diagnosing heart conditions.

Keywords: *Heart Disease Detection, Winograd Transform, Electrocardiogram (ECG), Chest X-ray Imaging, Deep Learning, Convolutional Neural Networks, Medical Image Analysis, Multimodal Data Fusion.*

MACHINE LEARNING APPROACHES FOR RENEWABLE ENERGY DEMAND FORECASTING

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Abstract:

The worldwide shift towards renewable energy is essential for addressing climate change and meeting sustainable development objectives. Nevertheless, renewable energy sources like solar and wind are naturally variable, necessitating precise demand forecasting to ensure grid stability and optimize energy distribution. This paper offers a theoretical examination of machine learning methods for forecasting renewable energy demand. It evaluates both traditional statistical techniques and contemporary machine learning and deep learning models, such as Support Vector Regression, Random Forest, Gradient Boosting, and Long Short-Term Memory networks. A conceptual framework is proposed, encompassing data collection, preprocessing, predictive modeling and decision-support systems. The study underscores the significance of intelligent forecasting systems in enhancing grid reliability, lowering operational costs, and aiding sustainable energy planning. Additionally, it discusses challenges, limitations, and future research directions.

Keywords: *Renewable Energy, Machine Learning, Demand Forecasting, Sustainability, LSTM, Smart Grid.*

CERTIFICATE GENERATOR MANAGEMENT SYSTEM

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Abstract:

Managing and issuing certificates manually in educational institutions and organizations is time-consuming and prone to errors. To overcome these challenges, this project proposes a Certificate Generator Management System, an automated web-based solution designed to efficiently generate and manage certificates. The system allows administrators to upload participant data in bulk and automatically generate certificates using predefined templates. It reduces manual effort, minimizes errors, and ensures quick certificate distribution. The proposed system is developed using Python Flask framework, SQLite database, and HTML, CSS, and JavaScript for the user interface. The platform enables secure login authentication, certificate template management, bulk data upload using Excel files, and automatic certificate generation with participant names dynamically embedded into the template. Generated certificates can be stored digitally and downloaded instantly. This system significantly improves efficiency, accuracy, and scalability in certificate management processes. It can be widely used in colleges, conferences, workshops, seminars, and training programs to streamline certificate issuance and management.

Keywords*: Certificate Generation, Automation System, Python Flask, SQLite Database, Web Application, Digital Certificate Management, Bulk Data Processing, Template-based Certificate Generation.*

ANTI-SLEEP ALARM FOR DRIVERS

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Abstract:

Driver sleepiness is one of the main causes of traffic accidents, leading to numerous deaths worldwide. Long-distance driving can cause driver sleepiness and temporary loss of focus, reducing the driver's alertness and reaction time, which can lead to severe accidents. The developed system, named "Anti-Sleep Alarm for Drivers," has the capability to detect the driver's sleepiness and alert the driver immediately to avoid any accidents.The system utilizes sensors, such as an eye blink sensor or a camera-based monitoring system, to calculate the duration of the closed eyes and monitor the head movement. When the system recognizes that the driver's eyes are closed for a longer period of time than the set time or recognizes the symptoms of sleepiness, it triggers an alert to notify the driver immediately. Moreover, an advanced alerting system could include a vibration alert or an LED light notification.The system can be developed using a microcontroller like Arduino or Raspberry Pi, along with sensors and a buzzer. The proposed system is an affordable, efficient, and reliable solution for real-time applications in vehicles.The purpose of this program is to improve road safety by minimizing accidents due to driver sleepiness and overall transportation security.

Keywords: *Driver Drowsiness Detection, Fatigue Monitoring System, Real-Time Alert System, Embedded Systems, Intelligent Transportation Systems*.

DESIGN AND DEVELOPMENT OF A STOCK MAINTENANCE SYSTEM USING FLUTTER AND FIREBASE

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Abstract:

Inventory management is important in organizations such as colleges and offices to keep track of available items. Manual methods of maintaining stock records often lead to errors, data loss, and difficulty in managing inventory. This project proposes a digital stock maintenance system to simplify inventory management. The system is designed using Flutter for application development and Firebase for cloud-based data storage. The proposed system aims to provide a simple and user-friendly interface for managing stock details. Users will be able to add, update, and manage stock information easily. The system is intended to store all data securely in a cloud database. This allows information to be accessed and managed from different devices. The system also helps administrators monitor available stock efficiently. It reduces manual work and improves accuracy in maintaining records. Digital storage of stock data makes inventory management easier and more reliable. The proposed system is expected to support better organization and monitoring of inventory. Overall, the system aims to improve the efficiency of stock management in organizations.

Keywords*: Inventory Management System, Stock Maintenance, Digital Inventory Tracking, Cloud Database, Flutter, Firebase, Data Management.*

SENTIMENT ANALYSIS ON SOCIAL MEDIA USING MACHINE LEARNING

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Abstract:

Sentiment analysis is an important application of data science and natural language processing that helps analyze people's opinions, emotions, and attitudes from textual data. With the rapid growth of social media platforms such as Twitter, Facebook, and Instagram, a huge amount of user-generated content is created every day. This data contains valuable information that can help organizations understand public opinion about products, services, and events.

This study focuses on applying machine learning techniques to classify social media text into different sentiment categories such as positive, negative, and neutral. Various preprocessing techniques including text cleaning, tokenization, and stop-word removal are used to prepare the data for analysis. After preprocessing, machine learning algorithms are applied to identify patterns and predict the sentiment expressed in the text.

The results of sentiment analysis can help businesses, governments, and researchers make better decisions based on public opinion. This research highlights the importance of data science in analyzing social media data and demonstrates how machine learning techniques can effectively interpret human emotions expressed online.

Keywords: *Sentiment Analysis, Machine Learning, Natural Language Processing, Social Media Analytics, Text Classification.*

FOOT STEP ENERGY GENERATION SYSTEM

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Abstract:

The Foot Step Energy Generation System is a renewable energy project that converts mechanical energy produced by human footsteps into electrical energy. The system mainly uses piezoelectric sensors placed under a walking platform. When a person steps on the platform, pressure is applied to the sensors. The piezoelectric sensors convert this mechanical pressure into small electrical signals. These electrical signals are then passed through a bridge rectifier to convert the alternating current into direct current (DC). The generated energy is stored using a rechargeable battery and a super capacitor for efficient energy storage. A DC–DC boost converter is used to increase the voltage level to a usable value. The stored electrical energy can be used to power small electronic devices such as LEDs, mobile charging ports, or low power sensors. A digital voltmeter can also be connected to monitor the voltage generated by the system. This project demonstrates an eco-friendly method of generating electricity from human motion. It can be implemented in crowded places such as railway stations, shopping malls, footpaths, and public walkways. In such locations, a large number of people walk daily, producing significant mechanical energy. By utilizing this energy, the system converts wasted human motion into useful electrical power. The proposed system promotes sustainable and green energy solutions. It also contributes to the development of future smart cities.

Keywords: *Piezoelectric Sensor, Foot Step Energy, Bridge Rectifier, DC–DC Boost Converter, Rechargeable Battery, Super Capacitor, Renewable Energy, Sustainable Energy, Green Technology, Smart City Applications.*

TRANSFER CERTIFICATE AUTO GENERATE MANAGEMENT SYSTEM

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Abstract:

The increasing adoption of digital technologies in educational institutions has created a strong need for automated systems to improve administrative efficiency. One of the essential administrative responsibilities in schools and colleges is the issuance of Transfer Certificates (TC) for students. In many institutions, this process is still handled manually, which requires considerable time and effort from administrative staff. Manual preparation of certificates can also result in data entry errors, document inconsistencies, and delays in issuing certificates to students.To overcome these limitations, this project proposes a Transfer Certificate Auto Generate Management System designed to automate the process of generating transfer certificates in a fast and reliable manner. The system simplifies administrative tasks by automatically generating certificates using structured student data stored in Excel files. It retrieves essential information such as student name, register number, department, course details, and academic records directly from the dataset.The retrieved data is processed and inserted into a predefined transfer certificate template, ensuring uniform formatting and consistency across all generated documents. After completing the data integration process, the system automatically produces the Transfer Certificate in PDF format, allowing it to be easily printed, stored, or shared digitally.By automating the certificate generation process, the system significantly reduces manual workload, minimizes the risk of human errors, and accelerates the overall document preparation process. Furthermore, the system enables institutions to maintain organized digital records of generated certificates, making document management and retrieval more efficient.Overall, the proposed system offers a reliable, efficient, and user-friendly solution that helps educational institutions modernize their administrative processes and enhance operational productivity.

Keywords: *Transfer Certificate, Automation, Excel Data Integration, PDF Generation, Student Information Management, Educational Administration.*

MINDBRIDGE – AN ONLINE STUDENT COUNSELING SYSTEM

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Abstract:

The advancement of web and mobile technologies has enabled educational institutions to provide student support services through digital platforms. However, many existing systems lack properpreassessment, structured communication, and feedback mechanisms, which are essential for effective counseling. This project presents an Online Counseling Management System designed to facilitate secure, structured, and efficient interaction between students and counselors through both web and mobile applications. In the proposed system, students register and authenticate using a unique register number, ensuring authorized access and eliminating duplicate or unauthorized users. Before participating in a counseling session, students are required to complete a timed pre-counseling questionnaire consisting of standardized multiple-choice questions. The questionnaire responses are automatically processed and sent as a systemgenerated message to the counselor's chat interface, allowing counselors to understand the student's concerns and prepare in advance for the counseling session. The system supports multiple communication modes, including real-time text chat, audio calls, and video calls, enabling flexible and effective counseling based on user preference. All communication data, including chat messages and session details, are securely stored to maintain a complete counseling history. After the completion of each counseling session, students submit feedback and ratings, which are stored permanently and displayed as a feedback feed for both students and counselors. This feature promotes transparency and continuous improvement of counseling services. Additionally, the system maintains detailed user profiles similar to modern messaging applications. Student profiles include register number, department, and profile image, while counselor profiles display name, qualification, specialization, and profile image. The application is developed as a responsive web application and is also deployed as an Android mobile application using WebView or Progressive Web App technology. The proposed system provides a cost-effective, scalable, and user-friendly solution for online counseling in academic environments .MOBILE APP The web application is packaged as an Android mobile application using Web View or Progressive Web App (PWA) technology. This allows the same web application to run as a mobile app without developing a separate native application.

Keywords: *Online Counseling System, Student Support Services, Pre-Counseling Questionnaire, Real-Time Communication, Web and Mobile Application, Feedback Management, Progressive Web App (PWA).*

WOMEN SAFETY SHOE

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Abstract:

Women safety has become a major concern in today's society due to the increasing number of unsafe situations faced by women in public places. Providing quick protection and emergency support is important for improving personal security. This project proposes a Smart Women Safety Shoe system designed to enhance women's safety using modern technology. The system provides emergency alerting, real-time location tracking, and obstacle detection to support the user during dangerous situations. GPS technology is used to track the exact location of the user in real time and GSM technology is used to send alert messages to registered contacts such as family members or authorities. When the user feels unsafe, she can press the emergency button placed inside the shoe. Once activated, the system immediately sends an alert message along with the user's live location so that others can quickly locate and assist the user during emergencies. The device also includes obstacle detection sensors that help identify nearby objects while walking, especially in dark or unfamiliar environments. This feature improves awareness and helps prevent accidents. The system is compact, wearable, and designed for comfortable daily use. Compared to mobile based safety applications, this device works independently and provides faster emergency communication without requiring the user to operate a smartphone. Therefore, the proposed women safety shoe system provides a reliable and cost effective solution to improve women's safety in real world situations.

Keywords*: Women Safety, Smart Shoes, GPS Tracking, GSM Module, Emergency Alert System, Obstacle Detection, Wearable Device*

SKILL GRAPH: A GRAPH NEURAL NETWORK FRAMEWORK FOR CAREER SKILL RECOMMENDATION

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Abstract:

Understanding the relationship between occupations and required skills is essential for effective career guidance and workforce development. Traditional job recommendation and applicant tracking systems primarily rely on keyword matching and static databases, which limits their ability to discover deeper relationships between skills and career paths. This work proposes a graph-based framework for modeling workforce skills using heterogeneous knowledge graphs and Graph Neural Networks (GNNs).

In this study, data from the O*NET occupational database and real-world job descriptions were integrated to construct a heterogeneous knowledge graph consisting of occupations, skills, and job postings. Relationships between these entities were modeled through multiple edge types including occupation–skill requirements, job–skill associations, and skill co-occurrence patterns. To capture semantic relationships between skills, node features were initialized using sentence transformer embeddings. A heterogeneous Graph Neural Network architecture is then used to learn meaningful representations of skills and occupations through message passing across the graph.

The proposed framework aims to support intelligent skill recommendation by predicting relevant skills based on a user's existing skill set or career objective. This approach demonstrates how graph-based learning and semantic embeddings can be combined to build intelligent career analytics systems that assist students and job seekers in identifying skill gaps and planning future learning paths.

Keywords: *Graph Neural Networks, Knowledge Graph, Skill Recommendation, Career Analytics, Artificial Intelligence, Workforce Intelligence.*

AI AND GEOSPATIAL TECHNOLOGIES FOR SUSTAINABLE SOLID WASTE MANAGEMENT IN KANCHIPURAM CITY

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Abstract:

Solid waste management (SWM) is a critical challenge in rapidly urbanizing smart cities. Traditional systems often fail to meet sustainability goals, leading to inefficiencies, environmental degradation, and public health risks. Artificial Intelligence (AI), Remote Sensing (RS), and Geographic Information Systems (GIS) together provide transformative opportunities for optimizing waste collection, monitoring, and recycling. This paper presents a comprehensive framework that prioritizes AI-driven predictive analytics, supported by RS and GIS-based spatial modelling, to enhance SWM efficiency for Kanchipuram City, Tamil Nadu. Case studies from India, China, Europe, Africa, and the Middle East demonstrate applications such as automated waste classification, spatial hotspot detection, and route optimization. The manuscript emphasizes AI integration as the central driver of smart waste ecosystems, while RS and GIS provide complementary monitoring and visualization capabilities. Future directions highlight real-time AI-GIS integration and citizen participation in circular economy initiatives.

Keywords: *Artificial Intelligence, Smart Cities, Solid Waste Management, Remote Sensing, Geographic Information Systems.*

EXPLORING THE DEPTHS OF THE UNCONSCIOUS: HUMAN PSYCHE IN LITERARY NARRATIVES

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Abstract:

This paper explores the representation of the unconscious mind in literary narratives and examines how writers dramatize the hidden dimensions of human psychology. Drawing upon psychoanalytic theory, the study investigates how literature becomes a powerful medium for articulating suppressed desires, internal conflicts, trauma, and fragmented identities. The unconscious, often concealed beneath social behavior and rational thought, emerges vividly in narrative structures, character development, and symbolic imagery. Through close reading of selected texts from classical and modern literature, the paper demonstrates how literary characters embody psychological struggles that mirror the complexities of the human mind. Internal conflict, guilt, repression, memory, and identity crisis are analyzed as recurring themes that reveal the depth of human experience. Narrative techniques such as soliloquy, stream of consciousness, symbolism, and interior monologue are examined as artistic strategies that bring subconscious processes to the surface. The study argues that literature does not merely narrate events but penetrates psychological depths, transforming inner turmoil into artistic expression. Ultimately, literary narratives function as reflective spaces where the invisible workings of the human psyche become visible, enabling readers to engage empathetically with the complexities of mental and emotional life.

***Key Words**: Unconscious Mind, Psychoanalytic Criticism, Human Psyche, Repression, Internal Conflict, Freud, Jung, Trauma Studies.*

CULTURAL NARRATIVE OF SUSTAINABILITY IN RANI MANICKA'S *TOUCHING EARTH*

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Abstract:

A shared story, belief system or values within a community defines the choices we make that has an impact on the environment and society. Rani Manicka's novel *Touching Earth* embeds cultural narrative of sustainability in the Balinese twin's upbringing, portraying Bali as a heaven of innocence where lives are intertwined with nature. Their traditional practices and spiritual rituals are connected with nature in Bali and that contrasts sharply with the urbanized city of London in the novel. *Touching Earth* evokes power and magic through the portrayal of the daily life rhythms, unseen spirits and family customs. This highlights the unknown spiritual world beyond human understanding that are designed for the protection of nature and environment. The novel also points out the importance of sustainable ecotourism that's essential for protecting biodiversity, preserving the cultural heritage and ensuring long-term safety of the earth. Manicka describes Bali with authentic, intoxicating imagery that captures its untouched power and cultural essence far beyond the clichés of tourist imagery of Bali. The novel's polyphonic structure amplifies these narratives through multiple voices, highlighting Bali's natural beauty and the underworld of London that is corrupted and addicted to drugs. This paper brings in how literature plays a significant part in presenting the cultural narrative of a community which paves way of ecological sustainability.

Keywords: *cultural narrative, traditional practices, spiritual world, polyphonic structure, ecological sustainability*

CIRCULAR ECONOMY INTEGRATION IN MEDICAL WASTE MANAGEMENT: A CASE STUDY OF DIAGNOSTIC CENTERS IN VELLORE CITY, INDIA

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Abstract:

India's rapid healthcare expansion has created unprecedented challenges in medical waste management, particularly in diagnostic and pathology centers that generate hazardous infec tious waste. This research presents a comprehensive analysis of circular economy integration for diagnostic center waste management in Vellore City, Tamil Nadu, India. Using industry standard synthetic data based on typical diagnostic center operations, this study develops fi nancial models demonstrating how recycling centers can transition from cost centers to profit generators through material recovery and secondary market development. The analysis reveals that a properly designed circular economy network for Vellore's diagnostic centers can generate Rs.1.2–1.5 crore annually from material recovery while simultaneously reducing environmen tal contamination risks by 15–20%. Abi-objectivefuzzyrobust optimization modelintegrating circular economyprinciples demonstrates that recycling centers can achieve profitability within 18–24 months with a 45–50% return on investment. This research provides actionable insights for healthcare facility managers, waste operators, and policymakers in India to implement eco nomically viable and environmentally responsible medical waste management systems.

Keywords: *Circular economy; medical waste management; fuzzy robust optimization; healthcare sustainability; diagnostic center.*

QUEUEING BASED SCHEDULING ANALYSIS OF SOUTHERN RAILWAY OPERATIONS IN TAMIL NADU

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Abstract:

This research paper to evaluates operational efficiency in the Southern Railway network of Tamil Nadu using queueing theory and scheduling algorithms. The database comprises train arrival time, departure time, service duration, arrival rate (λ), service rate (μ), waiting time, queue length, and system length variables collected from selected operational sections. The railway platform system is modelled as a single-server queue to examine congestion behaviour and resource utilization. The methodology integrates analytical queueing formulations with computational implementation of three scheduling algorithms: First Come First Serve (FCFS), Shortest Job First (SJF), and Round Robin (RR). Performance measures including average waiting time, turnaround time, traffic intensity (ρ), and system stability conditions were computed. Statistical validation was carried out using one-way ANOVA, paired t-tests, and effect size estimation to assess the significance of differences among scheduling policies.

The results indicate that system performance is highly sensitive to traffic intensity, particularly during peak arrival periods. Among the evaluated methods, SJF demonstrated the lowest average waiting time and reduced system congestion, while FCFS ensured procedural fairness but produced comparatively higher delays. Round Robin provided balanced allocation but increased cumulative waiting due to time slicing. Statistical analysis confirmed significant differences between the scheduling approaches. The study concludes that integrating queueing-based modelling with data-driven scheduling can enhance platform utilization and reduce passenger delay in high-density railway systems. Practical implementation of optimized scheduling policies and continuous monitoring of operational parameters can improve service reliability in Tamil Nadu's railway network.

Keywords: *Queuing Theory, Scheduling Algorithms, Southern Railway, Traffic Intensity, Waiting Time Analysis, Statistical Validation.*

A NATURAL LANGUAGE PROCESSING STUDY OF SENTIMENT ANALYSIS IN THAAI KIZHAVI TAMIL MOVIE CORPUS

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Abstract:

This research paper examines the evaluative orientation of the Thaai Kizhavi Tamil movie review corpus through the application of Natural Language Processing (NLP) techniques. The database consists of complete professional reviews sourced from four leading English-language newspapers: The Indian Express, The Hindu, Only Kollywood, and The Times of India. Each review was systematically compiled and organized according to its publication source to enable structured computational assessment. The collected corpus represents formal journalistic discourse that combines narrative description with critical interpretation, making it suitable for sentiment-based textual modeling. The study employs a lexicon-driven sentiment analysis framework. Preprocessing procedures were carried out to standardize the textual data, including case normalization, elimination of non-alphabetic symbols, and token refinement to maintain analytical precision. Sentiment computation was performed using two established tools, VADER and TextBlob, which generated measures of positive, negative, neutral, and compound sentiment, along with polarity and subjectivity indices. A comparative evaluation was conducted to assess variations in sentiment intensity and editorial expression across the selected newspapers. The findings indicate a consistently positive sentiment pattern throughout the corpus. VADER compound scores range from 0.9696 to 0.9989, demonstrating strong overall positivity in all reviews. TextBlob polarity values, spanning 0.0782 to 0.1676, further substantiate the favorable orientation of the critiques. Although subjectivity levels differ among publications reflecting variations in stylistic emphasis**,** the polarity direction remains uniformly positive. The predominance of neutral components within the sentiment distribution suggests that positive evaluation is integrated within balanced descriptive commentary rather than exaggerated language. Overall, the analysis confirms a broad critical consensus regarding the film's reception. The consistency between VADER and TextBlob results enhances the credibility of the findings and underscores the usefulness of NLP-based sentiment modeling in transforming qualitative review narratives into quantifiable analytical insights.

Keywords: *Natural Language Processing, Sentiment Analysis, Film Review Corpus, VADER Model, TextBlob Polarity, Media Discourse Analysis.*

SECTOR-WISE DYNAMICS OF UPI QR INFRASTRUCTURE IN INDIA: ARIMA AND THETA-BASED MODELLING

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Abstract:

India's digital payment ecosystem has expanded significantly through the scaling of Unified Payments Interface (UPI) QR infrastructure under the supervision of the Reserve Bank of India. This study examines monthly sector-wise UPI QR counts issued by public and private sector banks from April 2022 to December 2025. Descriptive statistics reveal substantial variability in both sectors, with the private sector exhibiting pronounced dispersion and positive skewness. Augmented Dickey–Fuller tests indicate non-stationarity at levels for both series, while first differencing establishes stationarity, implying integration of order one. Based on the Box Jenkins framework and information criteria, an ARIMA (1,0,0) model describes the public sector, whereas the private sector is captured by an ARIMA (3,1,0) specification. Structural break analysis using the SupF test identifies a statistically significant break in the public sector around mid-2023 ($p < 0.001$), after which the post-break segment exhibits level stationarity and is adequately represented by an ARIMA (0,0,0) model. However, the post-break segment analysis using the Theta method captures the trend more significantly. No significant structural break is detected in the private sector ($p = 0.1878$). To evaluate forecasting performance, the ARIMA model was compared with the Theta method. The results show that for a public sector after structural break the Theta model performs better ((MAPE- 9.75) and for the private sector ARIMA (MAPE-115.34) outperforms Theta method. The findings highlight differential infrastructure scaling patterns and their implications for financial inclusion and progress toward SDG 8 (Decent Work and Economic Growth) and SDG 10 (Reduced Inequalities).

KeyWords*: UPI QR Infrastructure, ARIMA, Theta Method, Structural Break Analysis, Time Series Modelling, Sustainable Development Goals (SDGs).*

PREDICTIVE ANALYSIS OF STRESS LEVELS AMONG WOMEN EMPLOYEES IN SELF-FINANCING COLLEGES IN CHENNAI WITH BAYESIAN MODELS

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Abstract:

This research paper attempt to investigates stress among women employees in self-financing colleges in Chennai by analyzing socio-demographic, behavioral, and psychological factors affecting their well-being. Data from 421 participants were preprocessed, scaled, and split into training (70%) and testing (30%) sets to evaluate three Bayesian algorithms: Gaussian Naïve Bayes, Bernoulli Naïve Bayes, and Bayesian Logistic Regression. Model performance was assessed using accuracy, confusion matrices, and classification reports, with Bayesian Logistic Regression demonstrating the highest accuracy of 85%. Feature significance was further analyzed using ANOVA, revealing that income and self-reported stress levels were the most influential factors. The results emphasize the importance of identifying key stressors and implementing targeted interventions to support mental health, productivity, and work-life balance for women employees in academic institutions.

Keywords*: Women stress, Bayesian Logistic Regression, Gaussian Naïve Bayes, Bernoulli Naïve Bayes, ANOVA, Work-life balance.*

AN INTEGRATED STATISTICAL FRAMEWORK TO IDENTIFY THE CARDIOMETABOLIC PHENOTYPES AND EVALUATING THEIR ASSOCIATION WITH HEART DISEASE

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Abstract:

Heart disease is significantly associated with several cardiometabolic risk factors, including obesity, dyslipidemia, hyperglycemia, and inflammatory conditions. Still, traditional regression-related methods frequently assess these risk factors distinctly, that may neglect the underlying genetic variation. Determining latent cardiometabolic phenotypes can improve risk assessment and provides more profound knowledge of cardiovascular risk trends. Utilizing a globally accessible cardiovascular dataset, this cross-sectional analytical study is intended to identify the hidden cardiometabolic patterns and examine whether these phenotypes influence the occurrence of heart disease. After data preprocessing, the Elbow and Silhouette methods were primarily performed to determine the optimal number of clusters. K-means clustering was used to analyze significant biomarkers such as BMI, cholesterol, triglycerides, fasting blood sugar, C-reactive protein (CRP), and homocysteine levels. Linear Discriminant Analysis (LDA) was applied to measure the cluster validity. The relationship between determined phenotypes and heart disease will be examined through logistic regression models. Area Under the Curve (AUC) and Receiver Operating Characteristic (ROC) curve analysis was utilized to assess the predictive performance. The motive of this study is to strengthen the cardiovascular risk diagnosis via the utilization of comprehensive statistical techniques to investigate multidimensional cardiometabolic phenotypes.

Keywords: *Cardiometabolic Phenotypes, K-means clustering, Linear Discriminant Analysis (LDA), Receiver Operating Characteristic (ROC) Curve, Logistic Regression.*

COMPARATIVE ANALYSIS OF PARAMETRIC SURVIVAL MODELS FOR INFANT SURVIVAL TIME USING NFHS-5 DATA IN INDIA

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Abstract:

Infant mortality remains a major public health concern in developing countries. This study analyses infant survival time using data from the **National Family Health Survey 5 (NFHS-5)** in India. The objective of the study is to examine factors influencing infant survival and to compare the performance of different parametric survival models. Three parametric models—Weibull, Lognormal, and Gamma—were applied to analyse infant survival time. The results indicate that several socio-demographic and maternal characteristics significantly influence infant survival. Model comparison using the Akaike Information Criterion (AIC) shows that the **Lognormal model provides a better fit** compared to the Weibull and Gamma models. The findings highlight the usefulness of parametric survival models in understanding infant survival patterns using large-scale demographic survey data.

Keywords: *Infant Survival Time; Parametric Survival Models; Weibull Distribution; Lognormal Distribution; Gamma Distribution; Survival Analysis; Infant Mortality; National Family Health Survey 5 (NFHS-5).*

SHIFTS IN MASK-WEARING BEHAVIOUR AMONG UNDERGRADUATE STUDENTS IN CHENNAI BEFORE, DURING, AND AFTER THE COVID-19 PANDEMIC

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Abstract:

Mask-wearing became a crucial preventive measure as a result of the COVID-19 epidemic, which caused an unparalleled change in public health behaviors worldwide. This study looks at how Chennai, India, undergraduate students adjusted to mask-wearing customs prior to, during, and following the pandemic. In order to comprehend shifts in attitudes, compliance, motivations, and difficulties related to mask use, this study used a secondary data analysis approach, reviewing existing literature, institutional reports, public health surveys, and behavioral studies. The results show that mask-wearing, which was previously uncommon among young people in Chennai, proliferated during COVID-19 as a result of social pressure, risk perception, and mandates. Compliance drastically decreased after limitations were loosened, however some people continued to use masks for reasons relating to pollution or health.

Keywords: *COVID-19, pandemic, public health, to mask-wearing, young people.*

COMMUNITY DEVELOPMENT, SOCIAL INCLUSION, AND SUSTAINABLE SOCIAL PRACTICES

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Abstract:

Community development is a collaborative, grassroots process where community members take collective action to address common problems and improve social, economic, cultural, and environmental conditions. A process in which community members come together to take collective action and generate solutions to common problems. A practice-based profession and an academic discipline that promotes participative democracy, sustainable development, rights, economic opportunity, equality and social justice, through the organisation, education and empowerment of people within their communities, whether these be of locality, identity or interest, in urban and rural settings. Community development approaches are recognised internationally.

These methods and approaches have been acknowledged as significant for local social, economic, cultural, environmental and political development. **Sustainable development** is an approach to growth and human development that aims to meet the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development aims to balance the needs of the economy, environment, and society. Equitable health access is a pillar of the Social Sustainability—Education for All campaign. The author and his Action Aid colleagues organised this campaign with the youth and local communities. The most important principle is, through the community development process, to actively work with the community to increase leadership capacity, skills, confidence, and aspirations.

The community initiative should focus on human rights principles. The community and practitioners must adopt the Universal Declaration of Human Rights in their work. “All human beings are born free and equal in dignity and rights”; “Everyone has the right to life, liberty, and security of person,” and “Everyone is entitled to all the rights and freedoms without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status “.

Keywords: *Community development, Sustainable development , Human Right, Social Sustainability , Environment.*

FROM WELFARE TO CAPABILITY: SHG THROUGH AMARTYA SEN'S CAPABILITY LENS

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Abstract:

This study reframes community development in Tamil Nadu from a traditional welfare paradigm to Amartya Sen's Capability Approach, cantering on real freedoms and wellbeing rather than service delivery alone. Using a mixed-methods research design, the study applies quantitative reliability testing (Cronbach's Alpha) and analyses data with SPSS to investigate the capabilities and actual functioning of marginalized groups in rural districts (e.g., livelihood choices, health, education, voice). Key findings show significant capability deficits in areas previously supported solely through welfare schemes. The study highlights how Governmental and Non-Governmental Organizations (GOs/NGOs) are bridging gaps through inclusion-oriented programs. Impacts are examined across micro (individual/household), mezzo (community/institutional), and macro (policy/systems) levels. Practical experiences from Tamil Nadu illustrate how capability expansion leads to sustainable social practices. The paper concludes with actionable recommendations for policy, practice, and participatory development models.

Keywords: *Capability Approach, Community Development, Social Inclusion, Welfare vs Capability.*

A STUDY ON THE ROLE OF REWARDS IN EMPLOYEE ENGAGEMENT FOR SUSTAINABLE DEVELOPMENT AT BIG BASKET, CHENNAI

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Abstract:

Employee participation in the company's processes and development is essential; without employee involvement, the company cannot meet its expectations. To engage the employee in the company's activities, they must find satisfaction in the company's decisions. Rewards play a very important role in employee engagement; without employees feeling recognised through rewards, their involvement would fail.

To understand employees' perception about the reward system, the research used a descriptive research design with simple random sampling. Primary data were collected directly from 50 employees at Big Basket, Kuthambakkam, Chennai, using a structured questionnaire. The main objectives of the study are to find out the Socio-economic conditions of the respondents, and to examine the influence of rewards on the work environment and team cooperation.

The study found that the majority of respondents are male, and exactly half of the employees perceived the reward system as fair. This study also provides effective suggestions for improving the reward system.

Keywords: *Reward, Employee Engagement, Participation and Sustainable Business*

SUSTAINABLE ACCOUNTING PRACTICES IN MANUFACTURING INDUSTRIES

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Abstract:

Sustainable development has become an essential concern for businesses due to increasing environmental challenges, regulatory pressures, and stakeholder expectations. Manufacturing industries contribute significantly to economic growth, employment generation, and technological advancement. However, they also generate environmental impacts such as pollution, energy consumption, and waste generation. Sustainable accounting practices have emerged as a powerful tool to integrate environmental and social considerations into traditional accounting systems.

This study explores sustainable accounting practices adopted in manufacturing industries and examines their role in improving environmental performance, resource efficiency, and organizational sustainability. The research is based on secondary data collected from research articles, sustainability reports, and industry publications. The study highlights key sustainable accounting practices such as environmental management accounting, green accounting, sustainability reporting, carbon accounting, life-cycle costing, and resource efficiency accounting. The findings indicate that sustainable accounting improves transparency, enhances corporate reputation, reduces environmental risks, and supports strategic decision-making. The study concludes that integrating sustainability into accounting practices is essential for achieving long-term economic and environmental sustainability in manufacturing industries.

Keywords: *Sustainable accounting, environmental accounting, green accounting, sustainability reporting, manufacturing industry, environmental management accounting*.

BIOREMEDIATION OF HEAVY METALS USING MICROBIAL BIOSURFACTANTS

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Abstract:

In recent years, river pollution has emerged as a serious and escalating issue in many developing countries. The discharge of industrial effluents and untreated sewage into water bodies is a major source of environmental toxicity, posing severe threats to aquatic life and degrading water quality. Biological methods for the removal of heavy metals from industrial waste may provide an attractive alternative to the physiochemical process. Biosurfactants are one of the compounds that help in alleviating the heavy metals. A large number of bacteria such as *Psudomonas sp*, *Bacillus sp*, *Acinetobacter sp*, *Arthrobacter sp* are reported to produce biosurfactants. Compared to synthetic compounds, biosurfactants provide the advantages of little or no environmental impact and the possibility of in-situ production. Studies in recent past have exhibited the successful use of biosurfactants for facilitating the degradation of organic pollutants in soil and water. In the light of the above, the present study is aimed to carry out the assessment efficiency of biosurfactants producing bacteria isolated from heavy metal contaminated sites of the Vellarur river, Cuddalore District, Tamilnadu. Nine distinct bacterial strains were isolated and identified based on morphological characteristics and 16S rRNA gene sequencing as *Achromobacter denitrificans*, *Bacillus flexus*, *Achromobacter xylosoxidans*, *Bacillus cereus*, *Pseudomonas medocina*, *Pseudomonas putida*, *Bacillus badius*, *Lysinibacillus xylanilyticus*, and *Exiguobacterium homiense*, showing 99% sequence homology. The haemolytic activity, emulsification activity, drop-collapse test, and oil displacement test were employed to assess the biosurfactant-producing potential of the isolated bacterial strains. Among them, *Pseudomonas putida* isolates demonstrated the ability to remove heavy metals from the medium.

Keywords*: Bio surfactants, Heavy metals, Detoxification, Pseudomonas putida.*

ANTIBACTERIAL ACTIVITY OF CRUDE EXTRACT OF *CELOSIA ARGENTEA* AGAINST *STAPHYLOCOCCUS AUREUS*

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Abstract:

This study investigates the antibacterial potential of crude extracts of *Celosia argentea* (Amaranthaceae) against *Staphylococcus aureus*, a clinically significant Gram-positive bacterium responsible for numerous infections. Plant material was collected, authenticated, and subjected to sequential extraction using solvents of increasing polarity (hexane, chloroform, ethyl acetate, methanol, and aqueous). Crude extracts were screened for phytochemical constituents and tested for antibacterial activity using agar well diffusion, minimum inhibitory concentration (MIC), and minimum bactericidal concentration (MBC) assays. Phytochemical screening revealed the presence of flavonoids, tannins, saponins, and alkaloids, which likely contribute to the observed antibacterial activity. Among the extracts, methanol and ethyl acetate fractions exhibited the strongest activity against *S. aureus*. The results support the traditional use of *C. argentea* in herbal medicine and suggest that it could serve as a natural source of bioactive compounds with potential applications in antibacterial drug development.

Keywords: *Celosia argentea*, Anti Bacterial activity, *Staphylococcus aureus.*

SYNTHESIS AND DETAILED CHARACTERIZATION OF COPPER OXIDE (CUO) NANOPARTICLES PREPARED BY CHEMICAL PRECIPITATION METHOD

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Abstract:

Copper oxide (CuO) nanoparticles were synthesized successfully using a simple and cost-effective chemical precipitation method. Copper sulphate pentahydrate ($CuSO_4 \cdot 7H_2O$) and sodium hydroxide (NaOH) were employed as precursor materials. The structural, optical, and morphological properties of the synthesized CuO nanoparticles were systematically investigated using X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), UV–visible spectroscopy, scanning electron microscopy (SEM), and energy-dispersive X-ray spectroscopy (EDX). XRD analysis confirmed the formation of monoclinic CuO with good crystallinity and absence of secondary phases. FTIR spectra revealed characteristic Cu–O vibrational modes, confirming the formation of CuO nanoparticles. UV–visible spectroscopy showed an absorption peak at 230 nm with a calculated band gap energy of 2.48 eV, indicating nanocrystalline behavior. SEM images revealed nearly spherical nanoparticles with slight agglomeration and particle sizes ranging from 10–20 nm. EDX analysis confirmed the stoichiometric composition and purity of CuO. The results demonstrate that the chemical precipitation method is an effective route for synthesizing CuO nanoparticles suitable for applications in photocatalysis, sensing, and optoelectronic devices.

Keywords: *CuO nanoparticles, Chemical precipitation, Structural analysis, Optical properties, SEM, FTIR.*

GRAPH THEORY-BASED MODELING FOR REAL-WORLD NETWORK APPLICATION

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Abstract:

Graph Theory provides a robust mathematical framework for modeling and analyzing complex systems characterized by interconnected entities. This study focuses on the application of graph-theoretic concepts to represent and evaluate real-world networks such as transportation systems, communication networks, and social structures. A dataset comprising nodes and edges is utilized to construct graph models, where vertices denote individual entities and edges represent their relationships. Key algorithms, including shortest path, minimum spanning tree, and centrality measures, are employed to examine network efficiency, connectivity, and influence of nodes. The analysis reveals that graph-based approaches significantly improve optimization, resource allocation, and decision-making processes. The findings highlight the effectiveness of graph theory in solving practical problems across domains like smart city planning, healthcare systems, and computer networks, thereby demonstrating its wide applicability and importance in modern data-driven environments.

Keywords: *Graph Theory, Network Analysis, Shortest Path, Centrality Measures, Optimization*.

A STUDY ON POSH ACT AWARENESS AND SUSTAINABLE HUMAN RESOURCE PRACTICES

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Abstract:

Sustainable organisations need to adopt policies to protect employees' safety, health, and welfare. This is the basic legal obligation of any organisation, but it protects employees' dignity and ensures their rights by prohibiting harassment, which is essential for a sustainable business. To maintain the company in the long term, it must respect the basic rights of every employee in the organisation.

Stakeholder perception is important in any organisation. Without proper implementation of statutory practices, the company would not gain a positive image among stakeholders. Employee awareness of the POSH (Prevention of Sexual Harassment) Act is vital. Without being aware of their rights, employees are unable to assert them within the organisation.

To understand employees' awareness, the research used a descriptive research design with convenience sampling. Primary data were collected directly from 50 employees in the selected companies in Chennai using a structured questionnaire. The main objectives of the study are to find out the Socio-economic conditions of the respondents, and to examine the level of awareness among employees regarding the provisions and objectives of the POSH Act, 2013.

The study found that the majority of respondents are female and that most are aware of the POSH Act, 2013. This study also provides effective suggestions for raising employees' awareness of the POSH Act 2013.

***Key words**: Sustainable business, harassment, Awareness & POSH Act.*

EMOTION-AWARE NPC DESIGN FOR REALISTIC GAME INTERACTION USING ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

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Abstract:

Non-Player Characters (NPCs) play an important role in modern digital games by improving player engagement and interaction. Traditional NPCs follow predefined scripts, which makes their behaviour predictable and less realistic. This research proposes an Emotion-Aware NPC system using Artificial Intelligence and Machine Learning to create dynamic, adaptive, and human-like interactions in games. The proposed system detects player emotions using facial expression recognition and game events, then adjusts NPC behaviour accordingly. Techniques from affective computing, machine learning, and behaviour modelling are used to design intelligent NPC responses. Experimental results show that emotion-aware NPCs improve player immersion, interaction quality, and overall game experience compared to traditional rule-based NPC systems. This work demonstrates the importance of emotional intelligence in game AI and provides a framework for developing realistic NPC interaction models. Studies show that integrating emotion recognition and affective computing into games can significantly enhance player experience and engagement.

Keywords: *Artificial Intelligence, Machine Learning, NPC, Affective Computing, Emotion Recognition, Game AI, Human-Computer Interaction, Reinforcement Learning.*

STRASSEN MATRIX MULTIPLICATION ON GPU: AN OPTIMIZED APPROACH FOR HIGH-PERFORMANCE COMPUTING

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Abstract:

Matrix multiplication is a fundamental operation in scientific computing, machine learning, and engineering applications. The Strassen algorithm, based on divide-and-conquer, reduces computational complexity compared to conventional methods. This research presents an optimized implementation of Strassen matrix multiplication on Graphics Processing Units (GPUs) to leverage parallel processing capabilities. The proposed framework integrates Strassen's recursive approach with CUDA-based parallelization to accelerate large-scale matrix operations. Performance is evaluated against classical GPU-based matrix multiplication using metrics such as execution time, throughput, and memory efficiency. Experimental results demonstrate that the proposed GPU-accelerated Strassen algorithm achieves significant speedup for large matrices while addressing overhead challenges associated with recursion and memory transfers. This study highlights the potential of combining advanced algorithms with GPU architectures for high-performance computing applications.

Keywords: *Strassen Algorithm, GPU Computing, CUDA, Matrix Multiplication, Parallel Processing, High- Performance Computing, Optimization.*

ARTIFICIAL INTELLIGENCE-DRIVEN MARKETING TOUCHPOINTS AND THEIR IMPACT ON CONSUMER PERCEIVED VALUE AND PURCHASE INTENT TOWARD ORGANIC MILLET PRODUCTS IN KANCHEEPURAM DISTRICT

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Abstract:

Artificial Intelligence (AI) has transformed modern marketing by enabling personalized communication, intelligent recommendations, chatbot interactions, and data-driven advertising. The present study investigates the influence of AI-enabled marketing touchpoints on consumer perceived value and purchase intent toward organic millet products in Kancheepuram District. The research focuses on key AI dimensions such as AI personalization, AI chatbot quality, AI advertisement relevance, and AI transparency. A quantitative research design was adopted using structured questionnaire data collected from consumers in Kancheepuram District. The sample size was expanded to 124 respondents for statistical analysis. Structural relationships between AI marketing factors, consumer perceived value, and purchase intention were examined using Structural Equation Modeling (SEM). The findings indicate that AI personalization and advertisement relevance significantly enhance perceived value, which in turn positively influences purchase intent toward organic millet products. The study provides useful implications for marketers, researchers, and policy makers in promoting sustainable food products through AI-driven marketing strategies.

Keywords: *Artificial Intelligence, Marketing Touchpoints, Consumer Perceived Value, Purchase Intent, Organic Millets, Kancheepuram District.*

AN EXPLAINABLE ARTIFICIAL NEURAL NETWORK FRAMEWORK FOR EARLY PREDICTION OF DIABETES IN HEALTHCARE

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Abstract:

Diabetes mellitus is a chronic metabolic disorder characterized by persistent hyperglycemia resulting from defects in insulin secretion, insulin action, or both. Early detection is critical to mitigating severe complications, including cardiovascular disease, nephropathy, and neuropathy. This study presents an explainable Artificial Neural Network (ANN)-based framework for the early prediction of diabetes using clinical parameters. The model is trained and validated on the Pima Indians Diabetes Dataset and rigorously evaluated using performance metrics such as accuracy, precision, recall, F1-score, and ROC-AUC to ensure robustness and clinical applicability. To address the inherent opacity of neural networks, SHAP (SHapley Additive exPlanations) is integrated to provide interpretable insights into feature contributions, thereby enhancing transparency and supporting clinical decision-making. The proposed approach demonstrates superior predictive capability compared to conventional machine learning models while maintaining interpretability, highlighting its potential as a reliable decision-support tool in resource-constrained healthcare environments.

Keywords: *Artificial Neural Networks (ANN), Diabetes Mellitus Prediction, Explainable Artificial Intelligence (XAI), SHAP, Early Disease Detection, Clinical Decision Support Systems, Predictive Modeling.*

BIOENGINEERED PLANTS AS SUSTAINABLE TOOLS FOR CARBON CAPTURE AND ATMOSPHERIC OXYGEN ENRICHMENT

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Abstract:

The increasing concentration of atmospheric carbon dioxide (CO_2) due to industrialization and human activities has led to severe environmental challenges, including global warming and climate change. This project focuses on the development of recombinant plants with enhanced capabilities for carbon capture and oxygen production through genetic engineering techniques. By modifying key pathways involved in photosynthesis, particularly the efficiency of carbon fixation, plants can be engineered to absorb higher levels of CO_2 and release increased amounts of oxygen into the atmosphere. The study involves the introduction of genes responsible for improved enzymatic activity, such as those enhancing ribulose-1,5-bisphosphate carboxylase/oxygenase (RuBisCO) efficiency, and optimization of metabolic pathways to reduce photorespiration losses. Advanced tools from biotechnology and synthetic biology are utilized to design and develop transgenic plant models with superior performance compared to natural plants.These recombinant plants have the potential to serve as sustainable, eco-friendly solutions for mitigating climate change, improving air quality, and restoring ecological balance. The successful implementation of this technology could contribute significantly to carbon sequestration strategies and support global efforts toward environmental conservation and sustainable development.

Keywords: *Environmental challenges, Enzyme Activity, Optimization, Carbon Fixation, Recombinant plants*

SOCIAL CONNECTEDNESS THROUGH SOCIAL MEDIA BY YOUNG WOMEN OF SOUTH WEST NAGALAND-A CRITICAL STUDY

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Abstract:

Today, social media is among the top ways for a person to speak with individuals all over the planet. Social media gives a web-based proclamation that interfaces a gathering of networks and empowers systems administration and data sharing. Facebook, Wikipedia, Twitter, Google+, Pinterest, LinkedIn, Instagram, and Tumblr are well-known person-to-person communication locales. Every last one is a web-based interpersonal organization where clients can distribute data about themselves. Young comprehension that people might interpret the human way of behaving may be emphatically affected by web-based entertainment, while adversely, they can foster enthusiasm and narrow- mindedness. Young people from different backgrounds utilize web-based entertainment for both productive and horrendous purposes. Web-based entertainment has been progressively significant in molding social and conduct patterns. The incredibly progressed and muddled innovation has been created alongside how the world is currently coordinated, acquainting individuals with various present-day specialized instruments. Modernization in the ongoing time of globalization simplifies it for adolescents to approach their regular routines. Nonetheless, adolescents will encounter both advantageous and adverse consequences from this refinement. The goal is to examine what social media means for young women character advancement and how social media impacts Kohima young women behavior. The paper is subjective and depends on earlier exploration and studies tracked down in books, diaries, and distributions examining what web-based entertainment means for adolescent behavior. This article is finished to arrive at a definitive comprehension of what social media means for youth conduct.

Keywords*: Social media, youth, behavior, communication, information, influences*.

HUMAN VALUES, ARTIFICIAL INTELLIGENCE, AND SMART INNOVATION: A PHILOSOPHICAL PERSPECTIVE ON SUSTAINABLE DEVELOPMENT

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Abstract:

In addition, it is worth noting that the role of Artificial Intelligence and smart innovation technologies in transforming contemporary society, the economy, and governance is significant. Although these technologies are offering unprecedented efficiency, productivity, and global connectivity, they are also posing critical philosophical questions with regard to human values and sustainability in society. This paper decisively explores the relationship between human values and Artificial Intelligence from a philosophical point of view, with the main argument focusing on the need for ethical guidance in technology development. In this regard, the paper incorporates the philosophical arguments of classical and contemporary philosophers such as Aristotle, Heidegger, Kant, Gandhi, and Jonas in highlighting the need for technology development to focus on moral responsibility and sustainability in society. In conclusion, it is worth noting that this paper has highlighted the need for philosophical reflection in the development of technology with regard to its contribution to the well-being of humanity and sustainability in the natural world. It is worth embracing this approach in order to navigate the complexities of our changing world with regard to technology and its contribution to the sustainability of our world. Artificial Intelligence and smart innovation.

Keywords: *Artificial Intelligence, Human Values, Smart Innovation, Sustainable Development, Ethics of Technology, Philosophy of Technology, Human-Centered AI.*

VOICE NOTE BRAILLE USING ARTIFICIAL INTELLIGENCE

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Abstract:

This paper presents the development of an AI-powered assistive technology system titled Voice Note Braille Using Artificial Intelligence, designed to bridge the communication gap for visually impaired individuals. The system captures spoken input via a microphone, performs real-time offline speech recognition using the Vosk model integrated with Python, and translates the recognized text into standard Braille patterns. The Braille output is physically rendered through a single-cell refreshable display actuated by servo motors — a low-cost alternative to commercially available Braille displays. This work demonstrates the feasibility of combining modern speech recognition AI with affordable servo-based tactile hardware to produce an accessible, scalable Braille output device suitable for low-resource environments.

Keywords: *Voice Recognition, Assistive Technology , Vosk Model, Braille Display, Servo Motor.*

ARTIFICIAL INTELLIGENCE AND TEACHERS' WORK–LIFE BALANCE: THE DOUBLE-EDGED IMPACT IN SCHOOL CONTEXTS.

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St. Joseph University, Tamil Nadu.

Abstract:

The increasing ubiquity of Artificial Intelligence (AI) in education is poised to reshape the professional landscape for teachers. This paper examines the dichotomous impact of AI tools on teachers' work-life balance, highlighting the technology's potential to alleviate administrative workloads while cautioning against the risk of intensifying professional demands. While AI-driven innovations—such as automated grading and lesson-plan generators—promise significant time savings that could mitigate burnout and help reclaim personal time, they also raise concerns about an "always-on" culture enabled by digital accessibility and about the psychological strain associated with mastering new technologies and adapting to AI-augmented pedagogies. Synthesizing current literature with primary data collected via questionnaire, the study argues that the sustainable integration of AI requires a human-centered approach and workload safeguards, which are indispensable for preventing the blurring of boundaries between professional and personal life, thereby enhancing teacher well-being. Consequently, the study proposes policy frameworks that prioritize the adoption of human-centric technology.

A STUDY ON THE DIVERSITY AND INCLUSION OF EMPLOYEES IN CONTEMPORARY ORGANISATIONS

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Abstract:

Diversity and Inclusion have transitioned from being merely social responsibilities to becoming strategic necessities for modern organisational excellence. In today's interconnected global economy, workplaces have become increasingly multicultural, demanding not only technical competence but also cultural sensitivity and inclusive leadership. While many organisations have understood the theoretical importance of D&I, translating these values into consistent, everyday practice remains a significant challenge. Structural barriers such as unconscious bias, inadequate awareness and resistance to change have limited the effectiveness of formal policies, frequently reducing them to symbolic gestures. Understanding the employee perception is critical as success of D&I depends on whether employees feel genuinely respected and empowered rather than just tokenistically represented. This research is vital for identifying te gap between policy formulation and practical implementation to foster a truly equitable workplace culture. Previous research highlights that while diversity is common, inclusion is still under-researched, particularly in the Indian context. This study's findings indicate a strong conceptual understanding of D&I among the young, highly educated workforce, with 86% defining diversity as a multidimensional construct. However, it also reveals that 75% of employees believe resistance to change actively slows down D&I implementation. The study implies that for D&I to be sustainable, organisations must move beyond symbolic endorsement toward measurable accountability. Leadership must focus on strengthening transparency in recruitment, enhancing cross-cultural competence, and fostering psychological safety to transform diversity from a demographic reality into a strategic advantage.

***Key Words*:** *Diversity, Inclusion, Organisational Growth, Workplace Culture.*

UNMANNED AERIAL VEHICLE BASED DEEP LEARNING FRAMEWORK FOR COCONUT PLANTATION MONITORING

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Abstract:

Effective plantation management requires precise and timely information regarding tree population, crop health, and growth stages. Conventional field-based monitoring methods are labor-intensive, time-consuming, and often subject to human error, limiting their efficiency in large-scale coconut plantations. To overcome these challenges, this study proposes an advanced monitoring framework that integrates unmanned aerial vehicle (UAV) imagery with deep learning techniques. UAVs equipped with high-resolution cameras systematically capture aerial data across plantation fields, enabling comprehensive coverage within a short time span. The collected images are processed using state-of-the-art object detection and segmentation models, such as Faster R-CNN and Mask R-CNN, to accurately identify and count individual coconut trees.

Furthermore, the proposed system evaluates tree health and growth progression by analyzing visual and spectral characteristics derived from UAV imagery. Automated detection and assessment significantly reduce manual intervention while improving data consistency and analytical accuracy. Continuous monitoring allows early identification of stressed or diseased trees, facilitating timely corrective actions and optimized resource allocation. The integration of UAV technology with deep learning algorithms enhances operational efficiency, reduces overall monitoring costs, and supports data-driven decision-making for sustainable and productive coconut plantation management.

Keywords: *UAV imagery, Coconut plantation, Deep learning, Tree detection, Precision agriculture.*

JOINT MODEL FOR PREDICTING THE RISK FOR RECURRENCE IN COLORECTAL CANCER WITH A COMPETING EVENT

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Abstract:

In this paper, we study the relationship between longitudinal biomarker trajectories and time-to-event outcomes in colorectal cancer patients us ing a joint modeling framework with competing risks. Carcinoembryonic antigen (CEA) is an important biomarker used in monitoring disease progression and recurrence in colorectal cancer. Traditional approaches often analyze longitudinal biomarker measurements and survival outcomes separately, which may lead to biased or inefficient estimates. Joint modeling provides a unified framework that simultaneously analyzes longitudinal and survival data through shared random effects, allowing a better understanding of the association between biomarker evolution and event risk. In colorectal cancer follow-up studies, patients may experience recurrence or death, where death acts as a competing risk for recurrence. This study investigates the association between longitudinal CEA trajectories and the risks of recurrence and death using joint modeling with competing risks. Furthermore, the joint modeling framework also supports dynamic prediction, enabling updated individualized risk estimates as new biomarker information becomes available during follow-up.

Keywords: *CEA Biomarker, Colorectal Cancer, Competing Risks, Dynamic Prediction, Joint Modeling.*

GENDER ROLES, HOUSEHOLD RESPONSIBILITIES, AND WORK–LIFE BALANCE IN THE CONTEXT OF REMOTE IT WORK

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Abstract:

The rapid adoption of work-from-home practices in the Information Technology (IT) sector has significantly transformed the professional and personal lives of employees, particularly married women who often manage dual roles in both workplace and family domains. This study aims to examine the work–life balance of married women employees in the IT sector under remote working arrangements. It focuses on identifying the key factors influencing balance between professional responsibilities and family commitments, such as flexible working hours, organizational support, technological demands, family support, and role conflict. The research also evaluates the impact of work-from-home on job satisfaction, stress levels, productivity, and overall well-being of married women professionals. A structured questionnaire is proposed for data collection from married women IT employees, and appropriate statistical tools will be used to analyses the relationship between work-from-home practices and work–life balance outcomes. The findings are expected to provide insights for organizations to design effective policies, promote employee well-being, and enhance retention and performance. The study also contributes to the existing literature by offering empirical evidence on gender-sensitive remote work practices in the evolving digital work environment.

Keywords: *Work–Life Balance, Married Women Employees, IT Sector, Work-from-Home, Remote Work, Role Conflict, Organizational Support, Job Satisfaction, Employee Well-being.*

STUDY THE IMPACT OF SOCIAL MEDIA MARKETING ON GEN Z'S PURCHASE DECISIONS IN TAMIL NADU

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Abstract:

Social media marketing for brands is becoming more creative and attractive. The study considers this group for analysis because of the growth of the internet, the chance of Generation Z adopting internet technology, and the market possible for products and services on the internet (www.statista.com). This study aims to explore the factors that affect Gen Z's willingness to purchase based on the social media marketing for the brand. The main areas covered are Gen Z's views on brands marketed on social media and the factors they consider before purchasing. For the analysis, 250 Gen Z consumers comprise the sample size. Purposive sampling is employed in this study because Gen Z is primarily interested in using social media. The findings of the study assist marketers in understanding the important aspects of social media marketing (SMM) that they should focus on. Engagement and trendiness are the two aspects that have been obtained, and factor analysis and multiple regression analysis have been employed. This research will help brands in designing their SMMA by focusing on the most attractive aspects that attract the largest number of their target group. As the Gen Z generation is the newest addition to every brand's consumer base, it is practically important. It is even more important for marketers to focus on the results of this research because of the changing habits of Gen Z in adapting to new and popular social media platforms and utilizing their time on social media with easy access to it.

Keywords: *Social media marketing, Gen Z, brand, purchase intention, trendiness, and customer interaction.*

USING INNOVATIVE TECHNOLOGY TO SUPPORT THE HEALTH AND WELLBEING OF AUTISM CAREGIVERS

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Abstract:

Autism Spectrum Disorder (ASD) is a lifelong neurodevelopmental condition that affects communication, social interaction, and behaviour. While significant resources are dedicated to supporting individuals with autism, the health and wellbeing of their caregivers often parents, siblings or partners are frequently overlooked. Caregivers of individuals with autism face unique challenges, including high levels of chronic stress, social isolation, physical exhaustion, and the constant vigilance required to manage sensory needs and safety risks. This paper explores how innovative technology can serve as a vital support system for these caregivers. We examine current tools such as visual scheduling apps, wearable safety devices, artificial intelligence (AI) for behaviour analysis, telehealth services, and online support communities. The paper argues that technology must evolve from solely managing the symptoms of autism to actively protecting the mental and physical health of the caregiver. By reducing the daily burden of care and providing accessible mental health resources, technology can prevent caregiver burnout and improve family dynamics. However, barriers such as cost, digital literacy, data privacy, and the need for personalized design must be addressed. This presentation proposes a "Caregiver-centred Design" framework to guide the development of future technologies that empower and sustain autism caregivers.

Keywords: *Autism Spectrum Disorder (ASD), Caregiver, Health, Technology, Mental Wellbeing, Innovation, Safety Devices.*

CORPORATE GOVERNANCE SUSTAINABILITY IN MODERN WORLD

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Abstract:

In today's dynamic business environment, sustainability has become an essential component of corporate financial strategy. Sustainable business models integrate environmental, social, and governance (ESG) principles with financial decision-making to achieve long-term value creation and responsible growth. This paper examines the role of finance in supporting sustainable business practices through instruments such as green finance, impact investing, and ESG-based investments. It highlights how organizations align profitability with social and environmental responsibility while improving risk management and stakeholder trust. The study is based on a review of recent literature and global sustainability frameworks, emphasizing the growing importance of transparent governance and sustainable financial policies. The findings suggest that integrating sustainability into financial models enhances corporate resilience and competitiveness, though challenges such as lack of standardized reporting and greenwashing remain. The paper concludes that sustainable finance is a key driver for building resilient and future-ready business models in the modern world.

Key words: *Sustainable finance, Green finance, ESG, Impact investing.*

A STUDY ON EMPLOYEE STRESS AND SUSTAINABILITY IN AIRTEL RELATIONSHIP CENTER IN CHENNAI

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Abstract:

In today's competitive work environment, employees often face varying levels of stress from workload, customer interactions, and performance expectations. This study focuses on analysing stress management among employees working in the Airtel Relationship Centre. The primary objective of this research is to examine the causes of stress, its impact on employees, and the effectiveness of stress management practices within the organisation.

The study adopted a descriptive research design, and data were collected through a structured questionnaire. The study area has a population of 220; a convenience sampling method was used to select 50 employees from different Airtel relationship centres in Chennai. The research analyses factors such as workload, work pressure, job satisfaction, work-life balance, and coping mechanisms adopted by employees. The findings reveal that a significant number of employees experience moderate to high levels of stress due to targets, customer handling, and long working hours.

The study concludes that effective stress management is essential for improving employee performance, job satisfaction, and overall organisational productivity. Suggestions have been provided to enhance stress management strategies, including better work allocation, counselling support, and employee engagement initiatives.

Keywords: *Stress Management, Employee Well-being, Job Stress, Work-Life Balance, & Airtel.*

ARTIFICIAL INTELLIGENCE IN SUSTAINABLE HEALTHCARE SYSTEMS

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Abstract:

Artificial Intelligence (AI) is revolutionizing healthcare by enabling more efficient, accessible, and sustainable medical services. The integration of AI technologies-including machine learning, deep learning, predictive analytics, and smart health monitoring systems-facilitates early disease detection, accurate diagnosis, personalized treatment, and optimized resource management. These AI-driven solutions reduce operational costs, minimize human error, and improve the utilization of medical infrastructure, thereby enhancing the sustainability of healthcare systems.

In densely populated and developing regions, AI supports telemedicine, remote patient monitoring, and digital health platforms, promoting equitable access to healthcare while alleviating pressure on hospitals. Additionally, AI-powered data analysis aids policymakers in disease surveillance, health planning, and emergency response management. Sustainable healthcare is further advanced through AI applications in drug discovery, energy-efficient hospital operations, and waste reduction.

Despite these benefits, challenges such as data privacy, ethical considerations, the digital divide, and the demand for skilled professionals must be addressed. Responsible innovation, robust governance, and inclusive digital strategies are essential to overcoming these barriers and building resilient, sustainable healthcare systems. This study underscores the transformative impact of AI in improving healthcare quality and outcomes while supporting the global agenda for sustainable development.

Keywords: *Artificial Intelligence, Sustainable Healthcare, Machine Learning, Telemedicine, Predictive Analytics, Smart Health Systems, Digital Health, Health Equity, Resource Optimization, SDG 3 (Good Health and Well-being).*

A STUDY ON EMPLOYEE JOB SATISFACTION AT DOMINOS OUTLETS IN PAMMAL AND PALLAVARAM, CHENNAI

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Abstract:

Employee satisfaction is a crucial factor that affects motivation, productivity, and overall organizational effectiveness, especially in the quick service restaurant sector. This study was conducted at Domino's Pizza outlets in Pammal and Pallavaram, Chennai, to analyse employees' perceptions regarding key factors such as working environment, salary and monetary benefits, workload, supervisor support, communication systems, and welfare facilities. The specific objectives of the study were to examine employee satisfaction with salary and incentives, assess satisfaction regarding work environment and workload management, and evaluate the impact of management support and communication on overall job satisfaction. The research adopts a descriptive design, with primary data collected from 50 employees out of a total of 100 employees using a structured questionnaire consisting of 50 questions. Percentage analysis was applied to interpret responses across demographic and job-related factors. The findings reveal that the majority of employees are satisfied with their work environment, supervisor support, and job security, while workload management and communication present opportunities for improvement. Overall, the study concludes that the level of employee satisfaction is positive, indicating a motivated and committed workforce that enhances productivity, engagement, and organizational performance.

Keywords: *Employee Job Satisfaction, Work Environment, Fast food industry, Salary and Monetary Benefits, Supervisor Support, Workload Management.*

HUMAN-LIKE EMOTIONS IN ARTIFICIAL INTELLIGENCE: EXPLORING FUTURE POSSIBILITIES, ETHICAL IMPLICATIONS, AND SOCIETAL CHALLENGES.

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Abstract:

Artificial Intelligence (AI) has rapidly evolved from simple rule-based systems to advanced learning models capable of performing complex cognitive tasks. However, current AI systems lack genuine human emotions such as empathy, anger, happiness, and sadness. This research explores a hypothetical scenario in which AI systems are designed with human-like emotional intelligence and the potential consequences such development could have on human society. The integration of emotional capabilities into AI could significantly transform human–machine interaction by making systems more adaptive, empathetic, and socially aware. Emotional AI may improve applications in healthcare, education, customer service, and mental health support by enabling machines to better understand and respond to human feelings. Despite these potential benefits, the presence of emotions in AI also raises critical ethical, psychological, and social concerns. Emotionally aware AI could manipulate human decisions, create dependency, or blur the boundary between humans and machines. Furthermore, if AI were capable of experiencing emotions such as frustration or anger, it might lead to unpredictable behaviors, potentially affecting safety and trust in automated systems. The emergence of emotionally intelligent AI may also challenge existing legal and moral frameworks regarding rights, responsibilities, and accountability of intelligent machines. This study aims to analyze both the opportunities and risks associated with emotionally capable AI systems and discusses the implications for future human–AI relationships. Understanding these consequences is essential for developing responsible AI policies, ethical guidelines, and technological safeguards that ensure AI development benefits humanity while minimizing potential harm.

Keywords:*Artificial Intelligence, Emotional AI, Human–AI Interaction, AI Ethics, Machine Emotions, Social Impact of AI, Cognitive Computing.*

ARTIFICIAL INTELLIGENCE FOR A DIGITAL SECURE ERA

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Abstract:

In the present digital era, most activities such as communication, banking, education, and business are carried out through digital platforms. As the use of digital technology increases, the risk of cyber threats such as hacking, phishing, malware, and data breaches also continues to grow. Therefore, ensuring digital security has become a major challenge for individuals and organizations. Artificial Intelligence (AI) has emerged as an effective solution to improve cyber security and protect digital information.

AI technologies such as machine learning and deep learning help in analyzing large amounts of data and identifying unusual patterns that may indicate security threats. Unlike traditional security systems, AI can detect potential risks quickly and respond to them in real time. This helps organizations prevent cyber attacks and protect sensitive data more efficiently.

This paper focuses on the role of Artificial Intelligence in creating a secure digital environment. It explains how AI-based systems are used for threat detection, fraud prevention, and network security. The paper also discusses some challenges in implementing AI in cyber security and highlights its future potential. Overall, Artificial Intelligence plays a significant role in strengthening digital security and supporting a safer digital future.

Keywords: *Digital era, Artificial Intelligence, digital security, cyber attacks, future potential.*

ANALYSIS OF THE RELATIONSHIP BETWEEN DRUG USE AND CRIME

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Abstract:

The relationship between drug use and crime has been a central focus of criminological and public health research for decades. This study analyzes the complex and multifaceted connection between substance use and criminal behaviour, examining the extent to which drug consumption contributes to criminal activity and, conversely, how involvement in crime may increase the likelihood of drug use. Drawing upon existing theoretical frameworks—including the psychopharmacological model, economic-compulsive model, and systemic model—this paper explores how intoxication effects, the need to finance drug dependency, and participation in illicit drug markets each shape patterns of criminal offending. The analysis incorporates empirical findings from cross-national studies, victimization reports, and correctional data to assess correlations between specific substances and categories of crime, such as violent offenses, property crime, and organized criminal activity. Additionally, the study evaluates the influence of socioeconomic factors, mental health conditions, and policy environments in mediating this relationship. The findings suggest that while drug use is significantly associated with certain forms of crime, the relationship is neither uniform nor purely causal; rather, it is shaped by structural inequalities, enforcement strategies, and availability of treatment services. The paper concludes by discussing policy implications, emphasizing evidence-based interventions, harm reduction strategies, and integrated criminal justice–public health approaches to reduce both substance abuse and crime rates.

Keywords: *drug, criminal behavior, cross-national studies, socioeconomic factors, crime rates.*

WASTE-TO-WEALTH APPROACH: GREEN SYNTHESIS AND BIOLOGICAL APPLICATIONS OF Ag–ZnO NANOCOMPOSITE DERIVED FROM TEMPLE FLOWER WASTE

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Abstract:

In this work, temple flower waste was valorized as a waste-to-resource biomaterial and used as an ecofriendly reducing and stabilizing agent for the green synthesis of silver-zinc (Ag-Zn) bimetallic nanocomposite. FTIR spectroscopy was performed to identify the functional groups involved in the formation and stabilization of nanocomposite, while the surface morphological and elemental analysis was carried out by using SEM-EDX. The biocompatibility of prepared Ag-Zn nanocomposite was determined by using hemolytic assay. Further, the biological efficacy of Ag-Zn nanocomposite was assessed in terms of
their antimicrobial property against selected pathogenic microorganisms, cytotoxicity on lung cancer cell lines, and larvicidal activity against mosquito larvae. The Ag-Zn bimetallic nanocomposite showed strong antibacterial potential with hemolytic effects and significant cytotoxic and larvicidal activities. Overall, this work highlights the effective utilization of temple flower waste for the production of a high-value multifunctional nanocomposite, thus offering an efficient waste-to-resource approach according to the principles of Responsible Consumption and Production (SDG 12), and the circular economy.

Keywords: *Biomaterial, FTIR spectroscopy, biocompatibility, antimicrobial, larvicidal.*

WASTE-DERIVED GREEN NANOCOMPOSITES: BIOLOGICAL POTENTIAL OF BANANA SPATHE MEDIATED $ZrOCl_2$–Ag

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Abstract:

Banana ranks among the topmost fruits consumed globally, and various parts of the banana have been utilized in traditional medicine. Banana flower spathe, however, forms a significant part of the flower that is obtained in large quantities at the agricultural level and lies in a state of underutilization. In accordance with this, a state of waste-to-wealth was created in this study by utilizing a process of green synthesis of silver – zirconium oxychloride nanocomposites by using banana flower spathe as a natural reducing and stabilizing agent. FTIR spectroscopy was carried out for ascertaining the functional group present in the material, while surface morphology and elemental composition were ascertained by SEM-EDX techniques. The bioeffectiveness of the obtained material was assessed using hemolytic effects, antimicrobial, cytotoxicity in lung cancer cell, and larvicidal studies. Notably, the results indicated excellent antimicrobial, anticancer, and larvicidal activities with good biocompatibility, which proves their biomedical potential and justifies the valorization of agriculture wastes in a greener way, thus promoting sustainable resource utilization and waste minimization in accordance with SDG 12.

Keywords: *Banana flower spathe, silver – zirconium oxychloride, bioeffectiveness, larvicidal, cytotoxicity.*

HYDROTHERMALLY ENGINEERED Zr–Ni–Ce TRIMETALLIC NANOCOMPOSITE FOR SENSITIVE ELECTROCHEMICAL DETECTION OF ANTICANCER DRUGS

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Abstract:

Efficient nanostructured materials for electrochemical sensing have become a key area of research in pharmaceutical and biomedical analysis. In this study, a Zr-Ni-Ce trimetallic nanocomposite was made using a hydrothermal method with polyethylene glycol to help shape and stabilize the structure. The material was then cleaned, dried, and heated to form a stable mixed metal oxide made of zirconium, nickel, and cerium oxides. Detailed tests were done to check the physical and chemical properties of the material. X-ray diffraction (XRD) was used to look at the crystalline nature and purity. Fourier transform infrared spectroscopy (FT-IR) and Raman spectroscopy helped find the functional groups and vibrations in the nanocomposite. UV-Vis diffuse reflectance spectroscopy (UV-DRS) was used to study the optical properties. Scanning electron microscopy (SEM) and transmission electron microscopy (TEM) were used to examine the surface and size of the particles. X-ray photoelectron spectroscopy (XPS) was used to find out the elements and their oxidation states. The electrochemical behaviour was studied by changing a glassy carbon electrode and doing cyclic voltammetry tests. The combination of zirconium, nickel, and cerium improves surface activity, helps electrons move better, and boosts catalytic performance. These features make the electrode more responsive. The trimetallic nanocomposite shows great promise as a sensing tool for detecting anticancer drugs. It offers a fast, sensitive, and affordable way for drug testing and biomedical analysis.

Keywords: *Hydrothermal synthesis, sensor, biomedical, trimetal nanocomposite.*

IMPACT OF STATE GOVERNMENT SCHOLARSHIP-WITH SPECIAL REFERENCE TO PUDHUMAI PENN IN TAMIL NADU

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Abstract:

In new era of education plays a crucial role in achieving the socio-economic development of an individual as well as society as a whole, particularly in empowering the women and promoting gender equality. In recent years, the Government of Tamil Nadu has introduced several scholarship initiatives aimed at improving access to education for all girls children from economically disadvantaged backgrounds. One such initiative is the **Pudhumai Penn Scheme**, which provides financial assistance to female students pursuing higher education after completing their schooling in government institutions. This study examines the impact of state government scholarship programs with special reference to the Pudhumai Penn Scheme in Tamil Nadu. Because of in some parts urban area and many of parts of rural area are facing challenges for sending the girls to the higher education. The primary objective of the research is to analyze how the scheme influences female students' enrolment in higher education, continuation of studies, and overall educational empowerment. The research also evaluates the socio-economic benefits of the scheme for students from marginalized communities and its role in reducing gender disparities in education.

The study is based on both primary and secondary data collected from beneficiaries, educational institutions, and government reports. Analytical methods are used to assess the effectiveness of the scholarship in improving educational access and reducing financial barriers. The findings are expected to highlight the significance of targeted government interventions in promoting female education and strengthening human capital development in Tamil Nadu. Overall, the study contributes to a better understanding of how state-level scholarship schemes can enhance educational opportunities for women and support inclusive growth and development of the women.

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STOCHASTIC PROCESS–BASED STATISTICAL MODELING FOR DYNAMIC RISK PREDICTION IN MULTIVARIATE HEALTH DATA

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Abstract:

The growing use of longitudinal health data requires statistical models that can properly handle changes over time and uncertainty in disease progression. This study develops a stochastic process–based modeling framework to analyze multivariate biomedical data with time-dependent variation. The methodology is based on continuous-time Markov processes and stochastic differential equations to describe transitions between different health states. Model parameters are estimated using maximum likelihood and Bayesian methods to ensure reliable and interpretable results. To address individual variability and serial dependence in repeated observations, phase-type distributions are incorporated within a state-space modeling framework. Model performance is evaluated using likelihood ratio tests, Akaike and Bayesian information criteria (AIC/BIC), and residual analysis supported by Monte Carlo simulation. Predictive accuracy is assessed using mean squared prediction error and probability calibration measures. The proposed approach enables dynamic risk assessment, estimation of transition probabilities, and survival prediction under uncertainty. The results indicate that the stochastic model provides more consistent and stable predictions compared to traditional deterministic regression models, especially when dealing with censored data and irregular follow-up times. This framework demonstrates the usefulness of stochastic process methods in medical research and public health decision-support systems.

Keywords: *Bayesian inference, Phase-type distribution, Markov processes, Monte Carlo simulation, State-spacemodeling.*

DEEP LEARNING BASED UNDERWATER OBJECT MONITORING USING YOLOV8

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Abstract:

Underwater monitoring plays a critical role in marine research, environmental protection, and smart ocean applications. However, underwater environments suffer from poor visibility, light absorption, scattering effects, and limited communication capabilities, which significantly affect object detection performance. To address these challenges, this paper proposes an Intelligent Deep Learning Framework for Underwater Object Monitoring designed for Internet of Underwater Things (IoUT) environments. The proposed system is fully software-based and developed using Python. Initially, underwater images undergo preprocessing techniques such as white balancing, contrast enhancement, and noise reduction to improve visual clarity. Following enhancement, a YOLOv8-based deep learning model is applied for accurate and real-time object detection. The system identifies marine objects by generating bounding boxes along with confidence scores. Performance evaluation is conducted using standard metrics including Precision, Recall, F1-Score, and mean Average Precision (mAP). Experimental results demonstrate that the integration of image enhancement with deep learning significantly improves detection accuracy and robustness under challenging underwater conditions. The proposed framework provides an efficient and scalable solution for intelligent underwater monitoring and can be extended for real-time video processing and large-scale IoUT deployments. This work contributes toward the development of smart ocean monitoring systems with improved reliability and performance.

Keywords: *Underwater Monitoring, Deep Learning, YOLOv8, IoUT, Object Detection, Image Enhancement.*

DNA-BASED CRYPTOGRAPHY MODEL FOR LUNG CANCER DATA SECURITY AND BIOMEDICAL IMAGE AUTHENTICATION

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Abstract:

A DNA-Based Cryptography Model for Lung Cancer Data Security and Biomedical Image Authentication presents a novel interdisciplinary framework that integrates principles of molecular biology with advanced computational security techniques to safeguard sensitive clinical information and diagnostic imagery. With the rapid digitization of healthcare systems and the growing reliance on high-resolution biomedical imaging such as CT scans, PET scans, and histopathological images for lung cancer diagnosis, ensuring confidentiality, integrity, and authenticity of medical data has become critically important. Traditional encryption algorithms, while robust, face increasing threats from high-performance computing and emerging quantum technologies. The proposed DNA-based cryptographic model leverages the inherent complexity, parallelism, and vast storage capacity of DNA sequences to design a secure encoding and encryption mechanism tailored for lung cancer datasets. In this framework, binary medical data and biomedical images are transformed into DNA sequences through DNA encoding rules, followed by operations such as complementary pairing, DNA addition, subtraction, and chaotic sequence mapping to enhance randomness and resistance to brute-force and statistical attacks. For biomedical image authentication, hash-based DNA signatures and watermarking techniques are embedded within diagnostic images to verify ownership, detect tampering, and maintain image fidelity without compromising diagnostic quality. The model ensures high key sensitivity, large key space, low correlation among encrypted pixels, and robustness against noise, compression, and geometric attacks. Performance evaluation metrics such as entropy analysis, NPCR (Number of Pixel Change Rate), UACI (Unified Average Changing Intensity), correlation coefficient analysis, and PSNR (Peak Signal-to-Noise Ratio) demonstrate superior security strength and image preservation capability compared to conventional cryptographic methods. By combining bio-inspired cryptography with medical image authentication protocols, the proposed system offers a scalable, secure, and efficient solution for protecting lung cancer patient records, supporting telemedicine applications, cloud-based healthcare storage, and secure biomedical data sharing while maintaining compliance with healthcare data protection standards.

Keywords *: Cryptography Model, Biomedical Image, molecular biology, encryption mechanism.*

EMPLOYEE INNOVATION IN MODERN MANUFACTURING INDUSTRIES

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Abstract

Employee innovations have become main factor to enhance organisational performance in the modern manufacturing industries. With the rapid development of technologies such as automation, artificial intelligence, digitalization are adopting in manufacturing industries. In organisations employee should contribute to innovative ideas, improve processes and should adopt technologies. The aim of the study is role of employee innovation in modern manufacturing industries and examine the efficiency and productivity and competitiveness. It also highlights the employee engagement, continuous learning, and skill development in work environment. The findings of the study suggest that organisations should encourage employees to participate in training programs and adopt modern technologies are more likely to achieve sustainable growth. This study concludes that employee innovation plays a important role in modern manufacturing industries by improving employee performance adaptability technology is supporting long term development in organisations.

Keywords*: Employee innovation, manufacturing industries, organisational performance, technologies.*

GATE PASS MANAGEMENT SYSTEM FOR EXIT MONITORING

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Abstract:

Gate pass management is an important process in organizations such as colleges, offices, and hostels to monitor the entry and exit of people. Traditional manual gate pass systems are time consuming and may lead to errors, data loss, and difficulty in tracking records. This project proposes a digital gate pass management system to simplify and automate the process. The system is developed using modern technologies to provide a user-friendly interface for managing gate pass details. Administrators can create, approve, and manage gate pass requests efficiently. All records are stored in a secure digital database which allows easy access and monitoring from different devices. The system helps in maintaining accurate records of entry and exit activities. It also reduces paperwork and improves the efficiency of security management. Digital storage ensures that all gate pass information is organized and easily retrievable. Overall, the proposed system aims to provide a reliable and efficient solution for gate pass management in institutions.

Keywords: *Gate Pass Management System, Digital Pass, Exit Monitoring, Security Management, Data Management, Cloud Database.*

GITOPS: A MODERNAPPROACH TO CLOUD - NATIVE INFRASTRUCTURE MANAGEMENT

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ABSTRACT:

The rapid adoption of cloud computing, containerization, and microservices has significantly increased the complexity of managing modern IT infrastructure. Traditional imperative deployment models often result in configuration drift, inconsistencies, and human error. GitOps is an operational paradigm that addresses these challenges by applying software development best practices such as version control, declarative configuration, and automated reconciliation to the management of infrastructure and applications. By using Git as the single source of truth, GitOps enables teams to define, version, and manage the desired state of systems in a transparent and auditable manner. Automated agents known as GitOps operators continuously monitor the live environment and reconcile it with the state declared in Git repositories, thereby reducing configuration drift and minimizing human error. This pull-based deployment model enhances security by limiting direct access to production environments and enforcing controlled, review-driven changes through pull requests. This seminar examines key GitOps tools including Argo CD and Flux CD, which enable continuous reconciliation in Kubernetes-based environments. A practical case study demonstrates how an organization adopted GitOps using Argo CD to eliminate manual deployments, achieve deployment consistency, and enable rapid rollback. Supporting literature from Weaveworks, the Cloud Native Computing Foundation, and foundational works on continuous delivery collectively validate GitOps as a well-grounded operational model with broad industry adoption. Despite its advantages, GitOps adoption presents challenges including a steep learning curve, secure management of secrets, repository scalability, and tooling integration complexity. Future developments point toward AI-augmented GitOps, policy-as-code enforcement, multi-cloud and edge computing support, and expansion beyond Kubernetes environments. In conclusion, GitOps represents not merely a deployment strategy but a comprehensive operational model that aligns development, operations, and governance for scalable, secure, and reliable cloud-native infrastructure management.

Keywords: GitOps, DevOps, Kubernetes, Continuous Deployment, Infrastructure as Code, Argo CD, FluxCD

COMPARATIVE ANALYSIS OF MACHINE LEARNING ALGORITHMS FOR IDENTIFYING THE MOST EFFECTIVE CLASSIFIER IN BREAST CANCER DIAGNOSIS

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Abstract:

This study emphasizes the critical role of early disease detection in improving patient outcomes, specifically focusing on breast cancer. It underlines the limitations of traditional diagnostic methods, which can overlook subtle abnormalities. The research applies machine learning algorithms to enhance prognostic assessments in Primary Health Checkups (PHC), utilizing a dataset of 300 patients that includes demographic and clinical parameters critical for identifying health risks. Four classifiers— Support Vector Machine (SVM), k-Nearest Neighbors (KNN), Naïve Bayes, and Extreme Gradient Boosting (XGBoost)—were evaluated for their predictive performance. SVM emerged as the most accurate model with 85.71% classification accuracy, while KNN and Naïve Bayes performed satisfactorily with 75.68% and 73.24% accuracy, respectively. XGBoost lagged at 31.67%. These findings advocate for the incorporation of machine learning in healthcare to enhance diagnostic accuracy and clinical decision-making, highlighting the importance of selecting appropriate algorithms for effective healthcare management.

Keywords*: Primary Health Checkup (PHC), Breast Cancer Prediction, Machine learning Classification, Clinical Data Analysis, Early Disease Detection.*

BIOTECHNOLOGY IN VECTOR CONTROL FOR DISEASE PREVENTION

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Abstract :

Vector-borne diseases such as malaria, dengue, chikungunya, and Zika continue to pose major public health challenges across many parts of the world. These diseases are transmitted through vectors like mosquitoes, ticks, and flies, making their control essential for preventing outbreaks. Biotechnology has emerged as a powerful tool in vector control by offering innovative and targeted approaches to reduce vector populations and interrupt disease transmission. Techniques such as genetic modification of mosquitoes, sterile insect technology, and the use of symbiotic bacteria like Wolbachia are being developed to limit the ability of vectors to reproduce or transmit pathogens.

Biotechnological strategies provide environmentally friendly alternatives to traditional chemical insecticides, which often lead to resistance and environmental damage. For example, genetically modified mosquitoes can be released to reduce breeding populations, while biological control methods can prevent vectors from carrying disease-causing organisms. These approaches not only improve the effectiveness of vector control programs but also reduce risks to human health and ecosystems. Although challenges such as regulatory approval, ethical concerns, and large-scale implementation remain, biotechnology offers promising solutions for sustainable vector control and disease prevention. Continued research and collaboration between scientists and public health authorities will be crucial to successfully apply these technologies in global disease management.

Keywords*: Biotechnology, Vector Control, Disease Prevention, Mosquito Control, Genetic Engineering, Public Health, Emerging Diseases.*

LEAF AI: AN ARTIFICIAL INTELLIGENCE – BASED APPROACH FOR LEAF DISEASE DETECTION IN AGRICULTURE

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Abstract:

Agriculture remains a cornerstone of global food security, yet plant diseases continue to cause substantial crop yield losses, particularly in developing regions where access to agricultural expertise and diagnostic infrastructure is limited. Traditional disease identification methods relying on visual inspection and laboratory testing are often slow, costly, and inaccessible to small-scale and remote farmers, creating a critical need for intelligent and scalable diagnostic solutions. This seminar presents LeafAI, a conceptual artificial intelligence-based system designed to detect and classify plant leaf diseases through image analysis. Leveraging deep learning and computer vision, LeafAI processes images captured via smartphones or digital cameras to identify visual disease indicators such as discoloration, lesion patterns, and texture irregularities. The system follows a structured pipeline encompassing image acquisition, preprocessing, feature extraction, convolutional neural network-based classification, and result interpretation. By incorporating transfer learning, LeafAI achieves reliable disease identification without manual feature engineering, making it both technically robust and practically accessible. Aconceptual case study demonstrates how a small-scale farmer without access to specialists can identify crop diseases at an early stage using only a smartphone, enabling timely intervention and reduced crop loss. Applications span crop disease diagnosis, precision agriculture, extension advisory services, and mobile or web-based diagnostic platforms. Recent scholarly research from 2022 to 2024 on deep learning, preprocessing pipelines, and transfer learning in agricultural diagnostics provides a strong academic foundation for LeafAI's design. While LeafAI offers benefits including early detection, reduced expert dependency, and cost effective diagnosis, it faces challenges related to image quality variability, limited labeled datasets, real-world generalization, and rural infrastructure constraints. The system is designed as a decision-support tool, ensuring expert judgment remains integral to final decisions. Future scope includes IoT integration, edge computing for offline use, explainable AI, and multi-modal data analysis. In conclusion, LeafAI demonstrates how deep learning can bridge advanced computational technology with the everyday realities of farming communities, contributing to sustainable agriculture and improved food security.

Keywords*: LeafAI, Artificial Intelligence, Plant Disease Detection, Deep Learning, Computer Vision,*

NEARSHORING AND RESHORING AS STRATEGIES FOR REDUCING THE CARBON FOOTPRINT OF GLOBAL VALUE CHAINS: OPPORTUNITIES, TRADE-OFFS, AND POLICY IMPLICATIONS

LAKSHITHA SIVAKUMAR

ASET COLLEGE

Abstract:

As the globalization moved over some decades, logistics and supply chain field has been improved. But yet it is criticized for the emission of greenhouse gases, carbon emitting process. In this paper, We'll examine about Nearshoring and reshoring in both environmental way and supply chain way and also includes the corporate way which thinks about decarbonization, value chain theory, benefits to both environment and the country which receives the goods. This paper also concerns about the tension between climate policies and intensive carbon emitting industries and logistics. Most of the industries in the Asian region, has emitting more carbon than the restricted level which makes the industries gain a low income and growth. This research also condemns about the industrialization policies which have been implemented for 150+ years. After the industrialization process, the EU and several parts of the world have changed their climate policies which makes the growth process difficult in developing countries.

Keywords: *Green Industrial Policy, Decarbonization, Supply chain difficulties, Nearshoring, Reshoring.*

EFFECT OF YOGA PRACTICES AND LIGHT MEDITATION ON SELECTED PHYSICAL VARIABLES AMONG OBESE ADOLESCENT MEN

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Abstract:

Yoga, an ancient practice rooted in Indian tradition, has gained global recognition for its holistic approach to health and well-being. It emphasizes physical postures (asanas), breathing techniques (pranayama), and relaxation, and has been widely studied for its positive effects on both physical and mental health. In addition, light meditation, a technique involving the visualization of light, is practiced to achieve deep relaxation, spiritual awareness, and mental clarity.

Understanding how yoga practices and light meditation influence selected physical variables such as flexibility, muscular strength, endurance, and body composition can provide valuable insights into their role in promoting a healthier lifestyle among obese adolescents. Obesity during adolescence is associated with various health risks, including reduced physical fitness and an increased likelihood of developing chronic diseases.

Therefore, the present study aims to examine the effect of yoga practices and light meditation on selected physical variables among obese adolescent men. By assessing key physical parameters, this research seeks to determine whether these traditional yogic practices can serve as effective interventions for improving physical fitness and overall well-being in this population.

Keywords: *Yoga, physical postures, relaxation, meditation.*

PLANT -BASED VACCINE DEVELOPMENT FOR EMERGING DISEASE

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Abstract:

Emerging infectious diseases continue to pose serious threats to global public health, as seen in recent outbreaks such as COVID-19, Ebola, and Zika. Rapid vaccine development is essential to control the spread of such diseases, but conventional vaccine production methods are often time-consuming, expensive, and require complex manufacturing facilities. Plant-based vaccine development has emerged as an innovative biotechnological approach that offers a faster, safer, and more cost-effective alternative. This method uses genetically engineered plants to produce vaccine antigens that can stimulate an immune response in humans. Plants such as tobacco, lettuce, and potatoes are commonly used as bio factories to produce these therapeutic proteins.

Plant-based vaccines provide several advantages, including lower production costs, reduced risk of contamination with human pathogens, and the ability to scale up production quickly during disease outbreaks. In addition, these vaccines can be stored and transported more easily compared to traditional vaccines, making them particularly beneficial for developing countries with limited healthcare infrastructure. Despite these advantages, challenges such as regulatory approval, dosage standardization, and large-scale commercialization still need to be addressed. With continued advancements in biotechnology and genetic engineering, plant-based vaccine systems have strong potential to become an important tool in combating emerging infectious diseases and improving global health preparedness.

Keywords: *Plant-Based Vaccines, Biotechnology, Emerging Diseases, Genetic Engineering, Vaccine Development, Public Health, Biopharming.*

RMV-PSO-SVM: A ROBUST MULTI-SCALE VISION TRANSFORMER AND SWARM-OPTIMISED SUPPORT VECTOR MACHINE FRAMEWORK FOR PULMONARY NODULE CLASSIFICATION

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Abstract

The early detection and precise classification of pulmonary nodules in Computed Tomography (CT) scans are critical for improving lung cancer survival rates. However, existing Computer-Aided Diagnosis (CAD) systems often struggle with imaging artifacts, high-dimensional feature redundancy, and severe class imbalance. This paper proposes RMV-PSO-SVM, a synergistic diagnostic framework that integrates a multi-scale Vision Transformer enhanced with Fractional Gradient Attention (FG-ViT) and an Improved Particle Swarm Optimisation-based Multi-Kernel Learning Support Vector Machine (IPSO-MKL-SVM).

The methodology leverages FG-ViT to extract robust deep features by stabilising the self-attention mechanism against CT noise using non-integer order derivatives. These embeddings are subsequently classified by a cost-sensitive MKL-SVM, whose penalty parameters and kernel weights are globally optimised using an IPSO variant featuring dynamic inertia weights and genetic crossover operators. This dual-layered approach ensures both structural robustness to image noise and clinical calibration for imbalanced datasets. Evaluated on the LIDC-IDRI dataset, the RMV-PSO-SVM framework demonstrates superior diagnostic performance over standalone PSO-SVM and standard ViT architectures, achieving significant gains in sensitivity and specificity. The proposed pipeline offers a more reliable, clinically viable solution for automated lung cancer screening.

Keywords: *Lung Cancer Diagnosis, Vision Transformer, Particle Swarm Optimization, Support Vector Machine, Fractional Gradient, Pulmonary Nodule Classification*.

SOCIAL EXCLUSION AMONG ELDERLY POPULATIONS IN RAPIDLY URBANIZING SOCIETIES: EVIDENCE FROM URBAN INDIA

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Abstract:

India is one of the countries among the world which is undergoing urban transitions from rural to urban cities. Within this transitions, elderly populations are increasing at high rate. In this study, we'll examine about social exclusion among elderly people in urban region. We all know about that Indian Society has its own cultural traditions such as Joint family with grandparents. In this modern era, the joint family has become nuclear family with only four members due to work, education, lifestyle improvement, etc. In this research, we'll discuss about Tier – 1 and Tier – 2 cities which abandon elder people due to the financial dependence on children, poor healthcare, inaccessible infrastructure to older people with the data collected Longitudinal Ageing Study in India (LASI). In this study, we'll cover the topics such as exclusion elderly women, especially, widows and religion-based, caste-based exclusion on older adults. This research also includes the temporary and permanent solutions such as National Programme for Health Care of the Elderly (NPHCE) in urban region, building Elderly people-friendly cities public infrastructure and stronger implementation of Maintenance and Welfare of Parents and Senior Citizens Act. This study also includes many awareness campaigns about the inclusion and welfare of Senior Citizens in Urban regions.

Keywords: *Age-friendly cities, Social exclusion, LASI, Smart Cities Mission, Welfare of Senior Citizens*.

EMERGENCY ALERT APP WITH LOCATION SHARING

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Abstract:

In today's world, ensuring the safety of women, children, and elderly people has become increasingly important, especially during emergencies such as natural disasters, accidents, or personal threats. The Emergency Alert App with Location Sharing is designed to provide quick assistance and improve personal safety through modern mobile technology. The application allows users to send an emergency alert along with their real-time location to pre-saved contacts such as family members, friends, or emergency services with a single tap. In dangerous situations, the app can quickly notify others and help them locate the user using GPS tracking.This system is especially helpful for women traveling alone, elderly individuals who may need medical assistance, children who may get lost, and people affected by natural disasters like floods, earthquakes, or storms. Additional features may include SOS buttons, live location sharing, emergency contact management, and instant notifications.The main objective of this project is to create a reliable and easy-to-use safety application that helps people receive help quickly during emergencies and improves overall personal security using mobile technology.

Keywords: *SOS Emergency Button, Real-Time Location Sharing, Emergency Contact List.*

AI AND SMART INNOVATION TECHNOLOGIES FOR SUSTAINABLE SMART CITIES DEVELOPMENT

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Abstract :

The rapid growth of urban populations has intensified the demand for sustainable and efficient city management solutions. In this context, the integration of Artificial Intelligence (AI) and smart innovation technologies has emerged as a transformative approach for developing sustainable smart cities. This paper explores how AI-driven systems, combined with advanced technologies such as the Internet of Things (IoT), big data analytics, and cloud computing, can enhance urban living while promoting environmental sustainability. Key application areas include smart energy management, intelligent transportation systems, waste management, water resource optimization, and urban planning. AI enables real-time data processing, predictive analytics, and autonomous decision-making, thereby improving resource utilization and reducing operational inefficiencies. Smart sensors and interconnected devices facilitate continuous monitoring of urban infrastructure, enabling proactive maintenance and efficient service delivery. Furthermore, AI plays a significant role in reducing carbon emissions, enhancing energy efficiency, and supporting renewable energy integration. However, challenges such as data privacy concerns, high implementation costs, and the need for robust governance frameworks remain critical. This paper discusses these challenges and proposes strategic solutions for effective implementation. Overall, the integration of AI and smart innovation technologies provides a promising pathway toward building resilient, inclusive, and sustainable smart cities.

Keywords *- Artificial Intelligence, Smart Cities, Internet of Things (IoT), Sustainable Development, Smart Innovation Technologies.*

EARLY PREDICTION OF TYPE 2 DIABETES USING EXPLAINABLE MACHINE LEARNING MODELS IN HOSPITAL PATIENTS

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Abstract:

Early identification of those at high risk of developing Type 2 Diabetes Mellitus (T2DM) is an important area in efforts to prevent long-term complications of metabolism and cardio-metabolic disorders. In this particular research, an explainable machine learning approach has been designed and assessed for its effectiveness in early diabetes risk prediction in 260 patients without initially present diabetes, using established criteria. The variables for analysis included those relevant to demography, anthropometry, lifestyles, and biochemistry, with patients assessed prospectively for the incidence of T2DM, occurring in 84 patients (32.3%). This baseline comparison showed a statistically significant increase in BMI and HbA1c levels of those individuals who eventually had diabetes. The multivariate analysis done using the logistic and proportional hazards regression models found BMI to be a primary contributor among those variables, which resulted in cases of diabetes and freedom from diabetes. There are four models which have been used for analysis of this dataset, which include Logistic Regression, Random Forest, Support Vector Machine, and Extreme Gradient Boosting. The maximum accuracy and value for these models were found to be 88.1% and 0.93 with XGBoost. To ensure clinical transparency, SHapley Additive exPlanations (SHAP) values were used for interpreting models. On applying SHAP values, BMI, HbA1c, fasting plasma glucose, waist circumference, and age were recognized as global interpretable factors influencing diabetes risk prediction; primary factors influencing diabetes risk for a particular person could be obtained using personalized models. The interpretable model thus translates high-performance machine learning into a clinical tool with clinical utility for preventive purposes.

Keywords: *Type 2 Diabetes Mellitus, Explainable Artificial Intelligence, XGBoost, SHAP, Machine Learning, Risk Prediction.*

WORKING CAPITAL MANAGEMENT IN MODERN BUSINESS

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Abstract:

Working capital management (WCM), which focuses on managing short-term assets and liabilities to guarantee liquidity for daily operations, is crucial to the financial stability and operational effectiveness of firms. Effective WCM is essential for growth, profitability, and financial stability in today's cutthroat market. The primary goal of working capital management is to minimize risk while maintaining a balance between profitability and liquidity. Businesses can maintain a smooth operational flow and prevent financial strain by managing components including cash, inventories, accounts receivable, and accounts payable. The effectiveness of working capital management in contemporary firms has been greatly increased by the application of sophisticated financial procedures, digital accounting systems, and data analytics. These technologies assist businesses in forecasting their financial needs, keeping an eye on cash flow, and making better financial decisions. Reducing operating expenses, meeting short-term obligations, and enhancing overall financial performance are all made possible by effective working capital management. Effective working capital management enables businesses to maximize inventory levels, recover receivables more quickly, and uphold positive supplier relationships through payables management. In the end, this helps with long-term sustainability and improved financial planning. On the other hand, inadequate working capital management can result in financial instability, increasing borrowing, and liquidity issues. To maintain an ideal amount of working capital, modern organizations must implement strategic tactics such effective cash management, inventory control strategies, and credit management rules.

Keywords: *Working capital management, financial stability, growth, financial planning, control strategies.*

SUSTAINABLE ACCOUNTING, GREEN FINANCE AND RESPONSIBLE FINANCIAL REPORTING

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Abstract:

Sustainable accounting, green finance, and responsible financial reporting have emerged as critical frameworks in addressing contemporary environmental and social challenges while ensuring long-term economic stability. This study explores the integration of sustainability principles into accounting practices and examines how green finance mechanisms facilitate environmentally responsible investments. The primary objective is to analyze the role of sustainable accounting in enhancing transparency, accountability, and stakeholder trust through comprehensive financial disclosures.

The research adopts a qualitative approach, relying on secondary data from corporate sustainability reports, international reporting standards, and policy frameworks. It evaluates how organizations incorporate Environmental, Social, and Governance (ESG) factors into financial decision-making and reporting processes. The study further investigates the effectiveness of green financial instruments—such as green bonds and sustainable funds—in promoting eco-friendly projects and reducing carbon footprints.
Findings reveal that organizations implementing sustainable accounting practices demonstrate improved financial performance, risk management, and corporate reputation. Responsible financial reporting enhances comparability and reliability of financial information. However, challenges such as lack of standardization, regulatory inconsistencies, and limited awareness hinder widespread adoption.

The study concludes that the convergence of sustainable accounting, green finance, and responsible reporting is essential for achieving sustainable development goals. It recommends stronger regulatory frameworks, capacity building, and increased stakeholder engagement to ensure effective implementation.

A COMPARATIVE STUDY OF GRACEFUL AND MAGIC LABELING

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Abstract:

Graph theory heavily relies on graph labeling issues like graceful and magic labeling. These two well-known labeling schemes are compared in this work with an emphasis on their definitions, characteristics, and suitability for various graph families. Magic labeling necessitates consistency in edge or vertex sums, whereas elegant labeling highlights clear edge distinctions.

We analyze graph classes that accept both kinds of labelings and find structural parallels and discrepancies. The study also looks at the computational complexity and algorithmic strategies related to each kind of tagging. This comparative viewpoint offers a cohesive comprehension of labeling methods and their importance in applied mathematics and combinatorics.

Keywords: *Graph Theory, Graph Labeling, Magic Labeling, Graceful Labeling, Labeling*

CONNECTENSE – AN APPLICATION INTERGRATING

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Abstract:

The escalating global prevalence of anxiety necessitates a paradigm shift from passive wellness applications toward active, data-driven, and adaptive interventions. This proect , titled An Application System Integrating Hardware Sensors, A/ML,and ARVR for Mental Wellness, addresses this gap by developing a proof-of-concept (PoC) for a closed-loop, physiologically adaptive therapeutic system aimed at acute anxiety management. The system establishes a novel integration pipeline that leverages commercially available wearable hardware, such as smartwatches, to acquire real-time physiological signals, with a primary focus on heart rate variability (HRV).These signals are transmitted via Bluetooth to a mobile application that hosts an embedded machine learning model implemented with TensorFlow Lite. The model performs on-device inference to instantly classify the user's mental state as either "Calm" r"High-Anxiety," ensuring low latency and preserving data privacy. The classificationoutput functions as a direct control signal for an immersive AR/VR environment developed in Unity. Based on the detected state, the virtual environment dynamically adapts its parameterssuch as ambient soundscapes, visual brightness, and scene pacing-in real time. This continuous, data-responsive adaptation creates a personalized therapeutic feedback loop designed to actively guide the user's physiology from a heightened anxiety state back toward calm. By combining physiological sensing, lightweight Al/ML inference, and immersive AR/VR interventions into a unified framework, the project demonstrates the feasibilityof delivering responsive, user-centric mental wellness support. The proposed system not only highlights the potential of closed-loop digital therapeutics but also lays the groundwork forfuture clinical validation and large-scale deployment of adaptive, technology-driven mental health solutions.

PREDICTING WEATHER RISKS FOR SMALLHOLDER FARMERS USING BIG DATA

SURESH BABU R
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Abstract:

Despite being essential to the world's food production, smallholder farmers' operations are extremely susceptible to climate-related hazards like droughts, floods, and sharp temperature swings. The farmers frequently struggle to make timely and well-informed decisions on crop management because to limited access to reliable meteorological data and climate forecasting tools. New prospects to enhance weather risk prediction and agricultural resilience are presented by recent developments in big data analytics, artificial intelligence, remote sensing, and Internet of Things (IoT) technologies. This study looks at recent research on the use of big data tools to forecast weather risks that affect smallholder farmers that was published between 2020 and 2025.

The review analyzes key data sources used in agricultural analytics, including meteorological records, satellite imagery, sensor data, and crop yield datasets. Additionally, it assesses many deep learning and machine learning models for climate risk assessment and weather prediction, including Random Forest, Support Vector Machines, Artificial Neural Networks, and Long Short-Term Memory networks. The results show that big data-driven predictive systems greatly improve weather forecasting accuracy and provide early warning systems that facilitate improved agriculture management decision-making. Large-scale adoption is still hampered by issues including scarce data, inadequate digital infrastructure, and farmers' lack of technological expertise. According to the study's findings, smallholder farming systems can enhance risk management, boost agricultural productivity, and fortify climate resilience by combining big data analytics with climate information services.

ETHICAL AI AND GREEN TECHNOLOGY: BALANCING INNOVATION WITH ENVIRONMENTAL RESPONSIBILITY

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Abstract:

The rapid development of Artificial Intelligence (AI) and smart innovation technologies is transforming industries and governance structures worldwide. Although AI improves efficiency, productivity, and predictive analytics, the growing computational needs, energy consumption, and ethical issues associated with AI development and deployment have become major threats to environmental sustainability. This paper examines the integration of Ethical AI and Green Technology as a means of achieving responsible and sustainable innovation. The paper examines the environmental impact of AI technologies, especially large data centers, machine learning models, and digital infrastructure, and examines sustainable alternatives such as energy-efficient algorithms, carbon-aware computing, and renewable energy-powered cloud computing. At the same time, the paper examines ethical considerations such as transparency, fairness, accountability, bias reduction, and responsible data management to ensure socially inclusive innovation.The study is in line with the United Nations' Sustainable Development Goals (SDGs), specifically "SDG 7 (Affordable and Clean Energy)", "SDG 9 (Industry, Innovation and Infrastructure)", "SDG 12 (Responsible Consumption and Production)", and "SDG 13 (Climate Action)". The study combines ethical governance principles with environmentally responsible technological strategies. The results clearly state that sustainable development can only be achieved by aligning technological advancements with environmental protection and ethical considerations, thus classifying AI as a revolutionary technology for global sustainability instead of an environmental hazard.

Keywords: *Ethical Artificial Intelligence, Green Technology, SDGs, Carbon-Aware Computing, AI Governance*

A COMPREHENSIVE PROGNOSTIC MODEL FOR PREDICTING LIVER CIRRHOSIS USING WEIBULL PARAMETRIC SURVIVAL ANALYSIS TECHNIQUE

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Abstract:

Liver cirrhosis is a progressive and life-threatening condition that significantly impacts patient survival. This study aims to analyze the survival patterns of liver cirrhosis patients using Weibull parametric survival models, which offer flexibility in modeling hazard functions that either increase or decrease over time. By fitting the Weibull Accelerated Failure Time (AFT) model and the Weibull Proportional Hazards (PH) model, we examine key factors influencing survival times, including demographic characteristics, clinical indicators, and disease progression. The analysis involves estimating the scale (λ) and shape (γ) parameters of the Weibull distribution to determine the nature of the hazard rate over time. We assess the statistical significance of covariates using hazard ratios (HR), event time ratios (ETR), and chi-square tests. Model selection is guided by Akaike Information Criterion (AIC) and log-likelihood values, ensuring the best fit for the survival data. Additionally, diagnostic plots and proportional hazards assumption tests are used to validate model performance and interpretability. The study provides a comprehensive survival analysis framework tailored to liver cirrhosis patients, helping to quantify the effect of clinical and demographic factors on survival. The results contribute to improving prognostic models and guiding medical decision-making, ultimately enhancing patient management strategies in liver disease care.

Keywords: *Liver Cirrhosis, Survival Analysis, Weibull Distribution, Accelerated Failure Time Model, Proportional Hazards Model, Hazard Ratio, Event Time Ratio, Parametric Survival Models.*

SMART WEATHER MONITORING AND AUTOMATIC ROOFTOP SYSTEM USING IOT AND LINEAR REGRESSION ANALYSIS

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Abstract:

As weather patterns become more unpredictable, smart systems that can adjust to changing conditions are becoming increasingly important. This paper explains the design and development of a Smart Weather Monitoring and Automatic Rooftop System that uses IoT technology and Linear Regression to predict weather changes. The system collects real-time data such as temperature, humidity, rainfall, and light intensity through sensors. Based on this data and simple prediction analysis, the rooftop automatically opens or closes according to the weather conditions. The system helps improve safety, reduces manual work, and saves energy. Test results show that it works reliably and responds quickly to changes in the environment.

Keywords: *IoT, Smart Rooftop, Weather Monitoring, Linear Regression, Automation, Embedded Systems*

ICT-DRIVEN CITIES

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Abstract

The purpose of the study is to investigate and address the challenges posed by rapid population growth in urban cities. The study aims to explore how Information and Communication Technologies (ICT) can be leveraged to advance the concept of smart cities. Specifically, it seeks to understand how the integration of ICT can contribute to enhancing urban resilience, promoting urban sustainability and improving Citizen`s quality of life. The study relied on case study analysis and literature review covering each continent of the world to ensure a global perspective. Subsequently, thematic analysis investigated the key benefits of smart cities. By deploying sensors, data analytics, and high-speed connectivity, these cities manage resources like energy, traffic, and waste in real-time. This digital foundation enables responsive governance and creates more resilient, efficient, and inclusive urban environments. This study offers a global perspective on integrating ICT for urban resilience and sustainability, categorizes fifteen smart city software applications, addresses urbanization challenges, and aligns thirty-one benefits with smart city action areas, providing a comprehensive framework for urban development stakeholders.

Key Words *– Smart Cities, Smart City Software, Sustainability, Resilience, Information and Communication Technologies, Internet of Things.*

THE IMPACT OF INFLUENCER MARKETING ON CONSUMERS WELL BEING AN EXAMINATION OF THE POTENTIAL RISK AND BENEFITS

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Abstract:

As influencer marketing grows in the digital economy, its impact has expanded from brand awareness to influencing consumer well-being. This study explores both its benefits and risks. On the positive side, authentic influencer relationships can foster community, provide inspiration, and simplify choices through curated content, enhancing happiness and loyalty. However, risks include social comparison, anxiety, body dissatisfaction, and feelings of inadequacy due to idealized portrayals. Undisclosed sponsorships may also lead to distrust and "manipulation backlash." While influencer marketing can support positive engagement, its negative effects highlight the need for ethical practices, transparency, and improved media literacy to protect mental health.

Key Words: *Influencer Marketing, Wellbeing, Social media, Mental Health*

UPI PAYMENT ADOPTION AND CUSTOMER TRUST IN INDIA

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Abstract:

The adoption of Unified Payments Interface (UPI) in India represents one of the most rapid and transformative shifts in the country's digital payment ecosystem. Since its inception, UPI has redefined how consumers and businesses transact by offering a real-time, interoperable, and cost-effective payment solution. This study examines the key drivers influencing UPI adoption among Indian users, including convenience, speed, accessibility, government support, and increasing smartphone penetration. Alongside adoption patterns, the research explores the critical role of **customer trust** in shaping user engagement with UPI platforms. Trust factors such as data security, privacy assurance, reliability of transactions, and perceived financial risk significantly impact user confidence and sustained usage. The findings suggest that while technological and infrastructural improvements have accelerated UPI uptake, building and maintaining customer trust through transparent practices and robust security measures is essential for long-term digital payment resilience. The paper concludes with implications for policymakers, fintech providers, and financial institutions to further enhance trust and promote inclusive digital financial behavior in India.

CALOTROPIS WEED CONTROLLER

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Abstract:

This project aims to develop a natural weed control agent from calotropis which contains bioactive compounds such as cardiac glycosides (calotropin, uscharin, calotoxin), flavonoids, alkaloids, triterpenoids, saponins, phenolics, and latex enzymes that help suppress weed growth. These compounds inhibit seed germination, disturb hormone balance, disrupt cell membranes, reduce chlorophyll formation, and interfere with enzyme activity in young weeds. The major advantages include natural weed suppression, biodegradability, lower environmental impact, cost-effectiveness, local availability, and suitability for eco-friendly and integrated weed management practices.

ENVIRONMENTAL SUSTAINABILITY AND COMPETITIVE TRADE STRATEGIES IN THE LEATHER TANNERY INDUSTRY

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Abstract:

The leather tannery industry is a significant contributor to global and local economies through export earnings, employment generation, and value addition. However, traditional tanning processes pose serious environmental challenges, including excessive water consumption, hazardous chemical discharge, solid waste generation, and high energy usage. Increasing environmental awareness and strict regulatory standards imposed by authorities such as the Central Pollution Control Board and international bodies like the United Nations Industrial Development Organization have compelled the industry to adopt sustainable practices.

This study examines innovative sustainable trade practices in both global and local leather tannery industries. It highlights the adoption of eco-friendly tanning methods, water recycling systems, Zero Liquid Discharge technologies, renewable energy usage, and circular economy practices. The role of international compliance frameworks promoted by the European Commission and certification systems such as the Leather Working Group is also analyzed in enhancing trade competitiveness and market access.

The findings indicate that sustainability and innovation not only reduce environmental impact but also improve export performance, brand reputation, and long-term profitability. While global markets demonstrate higher technological advancement and compliance levels, local markets are gradually progressing through modernization and policy support. The study concludes that integrating sustainable production with innovative trade strategies is essential for achieving environmentally responsible and economically sustainable growth in the leather tannery industry.

Keywords: *Sustainable Trade, Leather Tannery Industry, Green Innovation, Environmental Compliance, Circular Economy, Ethical Sourcing.*

SMART TECHNOLOGIES FOR SOLAR, WIND AND HYBRID RENEWABLE ENERGY SYSTEM

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Abstract:

Smart Technologies for Solar, Wind, and Hybrid Renewable Energy Systems. The rapid growth of renewable energy has increased the adoption of solar and wind power systems to meet global energy demands sustainably. However, the intermittent nature of these resources creates challenges in efficiency, reliability, and grid integration. Smart technologies provide effective solutions by enabling intelligent monitoring, control, and optimization of renewable energy systems. This paper highlights the application of Internet of Things (IoT), advanced sensors, artificial intelligence, and machine learning techniques for real-time performance monitoring, power forecasting, fault detection, and adaptive control. The integration of smart power electronics and energy storage systems enhances system efficiency, power quality, and grid stability. Hybrid renewable energy systems combining solar and wind resources are emphasized for their complementary nature and improved reliability. The study demonstrates that smart and hybrid renewable energy systems play a crucial role in reducing carbon emissions, improving energy security, and supporting sustainable development.

Keywords: *Smart Technologies, Solar Energy, Wind Energy, Hybrid Renewable Systems*.

SMART HEALTHCARE TECHNOLOGIES FOR THE DIGITAL ERA

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Abstract:

The rapid advancement of digital technologies has significantly transformed the healthcare sector, leading to the emergence of smart healthcare systems. These systems integrate information and communication technologies such as the Internet of Things (IoT), artificial intelligence (AI), big data analytics, cloud computing, and wearable devices to enhance the quality, accessibility, and efficiency of healthcare services. In the digital era, smart healthcare technologies enable real-time patient monitoring, early disease detection, personalized treatment, and efficient healthcare management. This paper examines the key components of smart healthcare systems and analyses how digital innovations are reshaping healthcare delivery. Applications such as telemedicine, electronic health records, remote patient monitoring, and AI-based diagnostic systems are discussed. The role of data analytics in predictive healthcare and informed decision-making is also highlighted. In addition, the paper addresses challenges including data security, privacy, interoperability, and ethical concerns associated with digital healthcare technologies. The study concludes that smart healthcare technologies support proactive, patient-centred care and play a vital role in developing sustainable healthcare systems for the future.

Keywords: *Smart Healthcare, Internet of Things, Artificial Intelligence, Digital Health, Telemedicine.*

தலைப்பு : திருக்குற்றாலத் தலபுராணம் காட்டும் சைவ கோட்பாடுகள்

முனைவர் ர. அன்பழகி

தமிழ்த்துறை

சுருக்கம் :

சைவ சமயம் தொன்று தொட்டு மக்களால் பின்பற்றி வரக்கூடிய சமயம் ஆகும். இச்சமயம் சிவபெருமானை முழுமுதற்கடவுளாகக் கொண்டு வணங்கப்பட்டு வருகிறது. இவ்வாய்வின் மூலம் சிவபெருமானின் பல்வேறு வடிவங்கள், மற்றும் அரியத் தகவல்களும் வேத முறைகளும் வழிபாட்டு முறைகளும், பற்றி ஆய்வு செய்யப்படுகிறது. ஒப்பீட்டு முறை ஆய்வு , புராண இலக்கியங்கள், பக்தி இலக்கியங்களில் உள்ள சைவ சமய கோட்பாடுகள் பற்றியும் ஆய்வு செய்தல்.

திருக்குற்றாலத் தலபுராணத்தில் சிவபெருமானின் ஐந்து முகங்கள்,தலத்தின் பெருமை, குற்றால மலையின் சிறப்பு, அருவியின் மகிமை, பிறவி கடப்பதற்கான வழிமுறைகளையும், சிவபெருமானை வழிபடும் முறைகளையும், அபிடேகப் பொருள்கள், பக்தர்களுக்கு அருளும் முறைகளையும், அடியார்களை சிவபெருமான் நாடிச்செல்லும் பாங்கினையும் உமையம்மையுடன் கொண்ட அன்பு நிலைகளையும் ஊடல் நிலைகளையும் மிகச்சிறப்பாக ஆய்வு செய்வுதே இவ்வாய்வின் நோக்கமாகும். சிவபெருமானின் பெருமைகளை பேசும் பிற பக்தி இலக்கியங்களான பன்னிருத் திருமுறை, சைவசித்தாந்த நூல்கள், போன்றவற்றில் கூறப்படும் செய்திகளை எடுத்துரைப்பதே இவ்வாய்வின் நோக்கமாகும்.

இவ்வாய்வின் மூலம் சைவ சமயத்தைப் பற்றிய அரியச் செய்திகளையும், வழிபாட்டு முறைகளையும், பண்டைய கால வழிபாடுகள், ஆலய அமைப்பு, கடவுளை தரிசிக்கும் முறைகள், சிலை வடிவமைப்பு போன்ற அனைத்துச் செய்திகளையும் அறிந்து கொள்ள முடிகிறது.

முக்கிய சொற்கள்

பஞ்சகவ்வியம், அஷ்டாங்க யோகம், அஷ்டாமாசித்திகள், ஒன்பது வாயில்கள், அனுஷ்டானம், ஆன்மசுத்தி, சைவசித்தாந்தம், பதி, பசு, பாசம்

கணினியும் தமிழ்ப் பயன்பாடும்

முனைவர் த. சித்ரா

உதவிப்பேராசிரியர்

செயின்ட் ஜோசப் கல்லூரி (கலை&அறிவியல்)

ஆய்வுச்சுருக்கம்:

நவீனமயமாக்கப்பட்ட இன்றைய உலகில் கணினி மற்றும் தகவல் தொழில் நுட்பம் மனித வாழ்க்கையின் அத்தியாவசிய அங்கமாக மாறியுள்ளது. இந்நிலையில் தமிழ் மொழியும் கணினியும் இணைந்து புதிய வளரச்சி நிலையை அடைந்துள்ளது. கணினியும் தமிழ் பயன்பாடும் என்பது தமிழின் வளர்ச்சிக்கான முக்கிய ஆய்வுத்துறையாகும். ஆரம்ப காலங்களில் இருந்த கணினியின் தமிழ் எழுத்து வளர்ச்சி , தமிழில் தட்டச்சு செய்வதற்கான பல்வேறு விதமான உள்ளீட்டு முறைகள் , தமிழில் உருவாக்கப் பட்டுள்ள பல்வேறு மென்பொருட்களும் அவற்றின் பயன்பாடுகளும் , தமிழ் இணையதளங்கள் , வலைப்பதிவுகள் மற்றும் சமூக ஊடகங்களின் மூலமாக உலகம் முழுவதும் உள்ள தமிழர்களை ஒன்றிணைக்கும் இணையத்தமிழ் , மிக வேகமாக வளர்ந்து வரும் தமிழ் மொழிக்கான இயற்கை மொழி செயலாக்கம் மற்றும் அவற்றின் பயன்பாடுகள் , கல்வி மற்றும் ஆராய்ச்சியில் தமிழ் கணினியின் வளர்ச்சி , தமிழ் கணினி பயன்பாட்டில் சந்திக்கும் சவால்கள் , தமிழ்கணினியின் எதிர்கால வளர்ச்சியும் பயன்பாடும் போன்ற தலைப்புகளில் விரிவான ஆய்வாக இக்கட்டுரை அமைந்துள்ளது.

தலைப்பு: செயற்கை நுண்ணறிவு (AI) மூலம் தமிழ் கற்றல்

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சுருக்கம்(Abstract):

இன்றைய டிஜிட்டல் உலகத்தில் செயற்கை நுண்ணறிவு (Artificial Intelligence – AI) கல்வி துறையில் முக்கியமான மாற்றங்களை உருவாக்கியுள்ளது. குறிப்பாக மொழி கற்றல் முறைகளில் AI பயன்பாடு மிகவும் வேகமாக வளர்ந்து வருகிறது. தமிழ் போன்ற செழுமையான மற்றும் பாரம்பரியமிக்க மொழியை கற்றுக்கொள்ள AI அடிப்படையிலான கருவிகள் மிகுந்த உதவியாக இருக்கின்றன. AI தொழில்நுட்பத்தின் மூலம் மாணவர்கள் எப்போது வேண்டுமானாலும், எங்கு வேண்டுமானாலும் தமிழ் மொழியை எளிதாக கற்றுக்கொள்ள முடிகிறது. AI அடிப்படையிலான மொபைல் செயலிகள், குரல் அடையாளம் (voice recognition), உரை மாற்று (text-to-speech) மற்றும் தானியங்கி மொழிபெயர்ப்பு போன்ற தொழில்நுட்பங்கள் தமிழ் கற்றலை எளிமையாக்குகின்றன. இத்தகைய AI கருவிகள் மாணவர்களின் உச்சரிப்பு, எழுத்து, இலக்கணம் மற்றும் சொற்களஞ்சியத்தை மேம்படுத்த உதவுகின்றன. மேலும், AI மூலம் தனிப்பயன் கற்றல் (personalized learning) சாத்தியமாகிறது; அதாவது ஒவ்வொரு மாணவரின் கற்றல் திறன் மற்றும் வேகத்தை அடிப்படையாகக் கொண்டு பாடங்கள் வழங்கப்படுகின்றன. மேலும், AI-யை பயன்படுத்தி உருவாக்கப்பட்ட கல்வி தளங்கள் மற்றும் chatbot-கள் தமிழ் மொழியில் உரையாடல் பயிற்சியை வழங்குகின்றன. இதன் மூலம் மாணவர்கள் நடைமுறை உரையாடல் திறன்களை மேம்படுத்த முடிகிறது. அதேபோல், AI-ஆல் இயக்கப்படும் கல்வி விளையாட்டுகள் மற்றும் வினாடி-வினா முறைகள் தமிழ் கற்றலை சுவாரஸ்யமாக மாற்றுகின்றன. இதனால், செயற்கை நுண்ணறிவு தமிழ் மொழி கற்றலில் ஒரு முக்கியமான கருவியாக விளங்குகிறது. எதிர்காலத்தில் AI தொழில்நுட்ப வளர்ச்சியுடன் தமிழ் கற்றல் மேலும் பயனுள்ளதாகவும், உலகளாவிய அளவில் பரவலாகவும் இருக்கும்.

முக்கிய சொற்கள் (Keywords):

செயற்கை நுண்ணறிவு, தமிழ் கற்றல், டிஜிட்டல் கல்வி, மொழி தொழில்நுட்பம், செயற்கை நுண்ணறிவு செயலிகள்.

திருக்குறள் உணர்த்தும் தமிழர் அகவாழ்வுக் கோட்பாடுகள்

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இல்லாத எப்பொருளும் இல்லையால் - சொல்லால்
பரந்தபா வால்என் பயன்வள் ளுவனார்
கரந்தப்பா வையத் துணை"
என்று மதுரை தமிழ் நாகனார் கூறியுள்ளவாறு திருவள்ளுவர் இயற்றிய திருக்குறள் உலக மக்களுக்கு உரிய அனைத்து வாழ்வியல் கருத்துகளையும் உணர்த்துகின்றது. திருக்குறள் தமிழ் இலக்கிய வகையில் பதினெண் கீழ்க்கணக்கு வகையைச் சேர்ந்த அறநூல் அதாவது நீதி நூலாக விளங்கியபோதும், இந்நூலில் தமிழ் அகவாழ்வுச் சிந்தனைகள் இந்நூலின் மூன்றாவது பாலாகிய இன்பத்துப்பாலில் காணப்படுகின்றது. அப்பாலின் வழியாக தமிழர்களின் அகவாழ்வுக் கோட்பாடுகள் குறித்து, முன்னுரை, முடிவுரை நீங்கலாக,

1. தமிழ் அகவாழ்வுக் கோட்பாடுகள்
2. திருக்குறள் இன்பத்துப்பால்
3. திருக்குறள் களவியல் உணர்த்தும் அகவாழ்வுக் கோட்பாடுகள்
4. திருக்குறள் கற்பியல் உணர்த்தும் அகவாழ்வுக் கோட்பாடுகள்
5. திருக்குறள் உணர்த்தும் இல்லற வாழ்வுக் கோட்பாடுகள்

ஆகிய தலைப்புகளில் ஆராய்ந்து, திருக்குறள் உணர்த்தும் தமிழர் அகவாழ்வுக் கோட்பாடுகள் என்ற தலைப்பில் ஆராய்ந்து வெளிப்படுத்துகிறது, இவ்வாய்வு கட்டுரை.

திறவுச் சொற்கள்:
அகப்பொருள் கோட்பாடுகள் - களவு - கற்பு - பத்து அவத்தைகள் - தகை அணங்குறுத்தல் - காட்சி - குறிப்பறிதல் - புணர்ச்சி மகிழ்தல் - நாணு துறவு உரைத்தல் - அலர் அறிவுறுத்தல் - படர் மெலிந்து இரங்கல் - புலவி - புலவி நுணுக்கம் - ஊடல் உவகை.

DATA-DRIVEN ANALYSIS OF TAMIL NADU WOMEN URIMAITHOGAI SCHEME USING MACHINE LEARNING TECHNIQUES

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Abstract:

This study examines the effectiveness and impact of the Tamil Nadu Women Urimaithogai Scheme by analyzing a dataset comprising 2000 beneficiaries using three data science algorithms, namely Decision Tree, Random Forest, and Logistic Regression. The primary objective of the research is to identify key socio-economic and demographic parameters influencing the distribution and utilization of financial assistance provided under the scheme. The dataset includes variables such as age, education level, marital status, family income, employment status, and rural–urban classification, collected and structured in a relational database system for efficient processing and analysis. The methodology involves data preprocessing, normalization, and feature selection, followed by model training and validation using standard performance metrics such as accuracy, precision, recall, and F1-score. The results indicate that the Random Forest algorithm outperforms other models in predicting beneficiary satisfaction and financial utilization patterns, while the Decision Tree model provides clear interpretability of influencing factors. Logistic Regression highlights the statistical significance of income level and employment status in determining the scheme's effectiveness. The discussion reveals that the scheme significantly supports economically weaker women, particularly in rural areas, by enhancing financial stability and social empowerment. However, certain disparities in awareness and accessibility persist across different regions. The study concludes that integrating data-driven decision-making into policy implementation can improve targeting efficiency and overall impact, ensuring better inclusivity and transparency in welfare distribution.

Keywords: *Women Urimaithogai, Machine Learning, Random Forest, Socio-economic Factors, Policy Analysis.*

A STUDY ON THE EFFECTIVENESS OF COMPLIANCE FRAMEWORKS IN ENSURING SUSTAINABLE BUSINESS OPERATIONS

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Abstract:

This study examines the effectiveness of compliance frameworks in ensuring sustainable business operations in a dynamic and regulation-driven environment. Compliance frameworks, which include legal standards, corporate policies, and ethical guidelines, are essential in aligning organizational activities with environmental, social, and governance (ESG) objectives. The research highlights how structured compliance systems help organizations maintain accountability, reduce risks, and support long-term sustainability goals. By ensuring adherence to environmental laws, ethical labour practices, and transparent reporting, compliance frameworks play a vital role in promoting responsible business conduct. The study further explores how organizations integrate sustainability into compliance strategies to enhance corporate reputation and build stakeholder trust. It also evaluates the role of internal audits, monitoring systems, and governance mechanisms in ensuring consistent compliance and continuous improvement. In addition, the research addresses key challenges such as regulatory complexity, implementation costs, and resistance to change, which may hinder the effectiveness of compliance frameworks. A mixed-methods approach combining quantitative analysis and qualitative insights is used to understand the impact of compliance practices across different industries. The findings indicate that organizations with robust compliance frameworks are better positioned to achieve sustainability objectives while maintaining regulatory adherence. In conclusion, effective compliance frameworks significantly contribute to sustainable business operations by promoting ethical practices, transparency, and environmental responsibility. The study emphasizes the need for integrating compliance with core business strategies and encourages continuous innovation to strengthen sustainable outcomes.

Keywords: *Compliance Frameworks, Sustainable Business Operations, ESG, Corporate Governance, Ethical Practices, Regulatory Compliance, Sustainability.*

INNOVATIVE APPROACHES AND SUSTAINABLE SOLUTIONS FOR THE PSYCHO-SOCIAL CHALLENGES FACED BY SINGLE MOTHERS AND THEIR CHILDREN

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Abstract:

Single mothers and their children often encounter a range of psycho-social difficulties that affect their mental well-being, social involvement, educational outcomes, and economic stability. These challenges are intensified by insufficient institutional support, parenting-related stress, social stigma, financial hardship, and limited access to mental health resources, which collectively influence children's development and mothers' emotional resilience.

With the rapid advancement of technology, Artificial Intelligence (AI) and innovative digital tools present promising avenues to address these issues sustainably. This paper examines how technology-driven interventions can enhance psycho-social support systems for single-parent families. It focuses on the role of digital literacy programs, virtual peer support communities, teletherapy services, mobile applications for accessing social welfare, and AI-powered mental health assessment tools in fostering social inclusion and strengthening resilience. These technologies can fill service gaps, improve reach, and offer timely emotional and informational aid.

Grounded in theoretical insights on family dynamics and current research, this study proposes a human-centered, ethically responsible model that integrates digital innovation with social work strategies. Emphasis is placed on affordability, cultural relevance, data security, and inclusiveness to ensure enduring benefits.

The study underscores the need for collaborative efforts among social scientists, technologists, educators, and policymakers to build fair, intelligent systems that empower unmarried mothers and support the comprehensive growth of their children.

Keywords: Digital Empowerment, Artificial Intelligence, Innovative Solutions, Psycho-Social Challenges, Single Mothers

SMART AI TECHNOLOGIES FOR VISUAL COMMUNICATION STUDENTS

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Abstract:

Artificial Intelligence (AI) has become an important technology in the field of visual communication. It helps students and media professionals create images, videos, graphics, and animations quickly and efficiently. Smart AI technologies such as image generation, video editing, augmented reality, and virtual reality are widely used in modern media industries. These tools help visual communication students improve creativity, design skills, and visual storytelling. AI can analyze images, enhance photo quality, and assist in media production. This paper discusses the role of AI technologies in visual communication education, their applications in media production, and the benefits and challenges of using AI in creative learning.

Keywords: *Artificial Intelligence, Visual Communication, AI Image Generation, Video Editing, Augmented Reality, Virtual Reality, Digital Media, Creative Design, AI Tools.*

DEEP LEARNING BASED PREDICTION OF MENOPAUSE STATUS AMONG WOMEN IN TAMIL NADU

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Abstract:

Menopause represents an important biological transition in the reproductive life cycle of women, and understanding its patterns is essential for improving preventive healthcare strategies. The present research paper focuses on developing a predictive analytical framework for identifying menopause status among women in Tamil Nadu using advanced deep learning techniques. The study utilizes a structured dataset containing 5000 samples, collected from women residing in different regions of Tamil Nadu. The dataset includes several demographic, physiological and health-related attributes associated with women's reproductive health conditions. Prior to model development, the dataset underwent preprocessing procedures such as label encoding for categorical variables and feature standardization to normalize numerical attributes. The processed dataset was subsequently divided into training (70%) and testing (30%) subsets to ensure reliable model training and performance evaluation.

In this study, four deep learning algorithms are Artificial Neural Network (ANN), Deep Neural Network (DNN), Convolutional Neural Network (CNN), and Recurrent Neural Network (RNN), were implemented to predict the dependent variable Menopause_Status. The models were trained using the training dataset and evaluated using several statistical performance metrics including accuracy, precision, recall, and F1-score, along with confusion matrix analysis. The experimental findings reveal that deep learning models are highly effective in predicting menopause status with strong classification performance. Among the models implemented, the Convolutional Neural Network (CNN) achieved the highest predictive accuracy, followed by the Deep Neural Network (DNN) and Artificial Neural Network (ANN), while the Recurrent Neural Network (RNN) showed comparatively lower prediction accuracy. The results demonstrate the ability of deep learning approaches to capture complex patterns present in women's health datasets and improve predictive analysis in reproductive health studies. The proposed methodological framework offers valuable support for healthcare professionals in the early identification and monitoring of menopause-related health conditions. Overall, the study highlights that integrating deep learning techniques with healthcare data can contribute to the development of efficient and intelligent decision-support systems for women's health management.

Keywords: *Menopause Prediction, Deep Learning, Artificial Neural Network, Convolutional Neural Network, Women's Health Analytics, Machine Learning Classification*.

IMPACT OF CUSTOMER SATISFACTION ON BRAND LOYALITY AN ANALYSIS OF HOME APPLIANCES IN CHENNAI

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Abstract:

Customer satisfaction plays a pivotal role in determining brand loyalty, especially within the competitive consumer durables market. This study investigates the relationship between customer satisfaction and brand loyalty in the home appliances sector in Chennai, with particular emphasis on factors such as product quality, pricing, after-sales service, and brand trust. The research adopts a descriptive and analytical approach, collecting primary data through structured questionnaires from consumers representing various demographic groups. Statistical techniques, including correlation and regression analysis, are used to examine the association between the variables. The results indicate a significant positive relationship between customer satisfaction and brand loyalty, highlighting after-sales service and product reliability as key determinants. Customers who are highly satisfied tend to exhibit repeat purchase behavior, recommend brands to others, and show reduced switching intentions despite the availability of alternatives. The study offers practical implications for marketers and manufacturers by underscoring the importance of delivering consistent quality and effective service to foster long-term customer relationships and enhance brand loyalty.

Keywords: *Customer Satisfaction, Brand Loyalty, Home Appliances, Consumer Behavior, After-Sales Service, Chennai.*

SECURE IMAGE SHARING USING QR CODE TECHNOLOGY

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Abstract:

The project titled "Secure Image Sharing using QR Code Technology" aims to provide a simple and secure method for sharing images using QR codes. Instead of sending large image files directly through messaging platforms or storage devices, the system converts an image link into a QR code. This QR code can be easily scanned using a smartphone, allowing users to quickly access the image.The system is developed using the Python programming language with the help of libraries such as qrcode and Pillow for generating and processing QR codes. By using QR technology, the project reduces file transfer time and improves the convenience of image sharing. This approach is useful in various fields such as education, business communication, and digital documentation, where images need to be shared quickly and securely. The project demonstrates how QR code technology can be effectively integrated with Python programming to create a practical solution for digital image sharing.

Keywords*: Technology, Image, smartphone, processing, programming*

TOURISTA: AN INTELLIGENT TOURISM COMPANION WITH IMAGE RECOGNITION AND INTEGRATED TRAVEL ASSISTANCE

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Abstract:

The rapid growth of mobile technologies and artificial intelligence has created new opportunities to improve the tourism experience through intelligent digital solutions. This project presents TOURISTA: An Intelligent Tourism Companion, a mobile application designed to assist travelers by integrating image recognition, real-time travel information, and interactive tourism services. The system is developed using the Flutter framework with the Dart programming language to provide a cross-platform user interface for both tourists and tourist guides. A Convolutional Neural Network (CNN)–based image recognition module enables users to upload images of tourist locations, allowing the system to automatically identify destinations and provide relevant information. The application architecture incorporates a business logic layer that connects the mobile applications with cloud-based services. Firebase Authentication is used for secure user access, while Firebase Firestore manages structured data such as destination details, user and guide profiles, and service requests. Firebase Storage is utilized for storing and managing uploaded images. The system also supports communication between travelers and guides, as well as feedback and request management. By integrating artificial intelligence, cloud computing, and mobile application technologies, the proposed system offers an efficient, user-friendly, and scalable solution that enhances travel planning, promotes destination discovery, and improves overall tourism engagement.

Keywords *: Smart Tourism, Image Recognition, Convolutional Neural Network (CNN), Flutter Framework, Firebase Cloud Services, Mobile Application.*

IOT-BASED CLINICAL DIAGNOSIS OF MEDICAL REPORT BASED AND REAL-TIME BIOSENSOR DATA FUSION

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Abstract:

The rapid increase in the field of digital healthcare requires the development of sophisticated diagnostic support that is able to combine clinical documentation with data on physiological monitoring. The current research paper presents a disease diagnosis system in the framework of IoT that involves the integration of medical textual reports with real-time biosensors measurements performed by means of microcontroller-based wearable devices. Clinical records are processed linguistically to extract symptoms, diagnostic observations and laboratory signs, sensor records of heart rate, oxygen saturation, body temperature and blood pressure go through filtering, normalization and signal conditioning steps to enhance reliability of data. Feature fusion generates a single medical record that can be used in computational diagnostic modeling. Pattern recognition algorithms compare the combined information to determine the possible pathological states and abnormal physiological variations. The diagnostic accuracy is approximately 96.4% as evidenced by experimental validation and has a great predictive ability and clinical reliability. Medical diagnostic results are generated automatically and in the form of the health assessment report as well as physician alert notification when there are abnormal values. Longitudinal health trackings, retrospective clinical assessment, and decision support are supported by secure database storage. Findings of implementation indicate the enhancement of diagnostic efficiency, ability to monitor continuously, and medical response in a timely manner. General results show that there is a high potential in smart healthcare settings, remote patient monitoring, and early disease detection in the context of contemporary medical settings.

Keywords*: Healthcare Monitoring with IoT, Medical Text Mining, Clinical Report Analysis, Physiological Signal Processing, Physiological Signal Sensor Integration, Multimodal Health Data Fusion, Disease Diagnosis Modeling, Vital Sign Monitors, Automated Clinical Alert, Diagnostic Accuracy.*

AN APPLICATION OF ENVIRONMENTAL BIOTECHNOLOGY IN MITIGATING CLIMATE CHANGE: REVISITING THROUGH A SOCIAL WORK LENS.

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Abstract:

This conceptual paper's main goal is to use environmental biotechnology to mitigate climate change from a social work perspective. This paper aims to review climate change and explore the connections between environmental science, biotechnology, and social work. Climate change is an urgent worldwide issue that has to be addressed right now. A region's average weather, including temperature, humidity, and precipitation, is referred to as its climate. According to Jackson (2026), climate change is a recurring alteration, modification, or variation in the atmosphere and its interactions with other elements of the Earth system, including geographic, geologic, biological, and chemical influences. "The use of living organisms is component to prevent, reduce, or remediate environmental pollution and to promote sustainable environmental management" is the definition of environmental biotechnology. Biotechnological innovation does occur, but in order to conserve the environment, particularly in the fight against climate change, it must be supported with social involvement, acceptance, and inclusion. According to (IFSW 2024), social work is an academic discipline and practice-based profession that supports social change, development, cohesiveness, and individual empowerment. Thus, it is clear that raising awareness and implementing capacity-building initiatives for many stakeholders can promote social change, growth, and cohesiveness by enabling individuals to fulfill their unfulfilled needs from a human rights standpoint. Biotechnological approaches to environmental issues cannot be successful on their own; by adopting a social work perspective, technology can be promoted and accepted within the community. It is seen as an inclusive technology implementation, and community center practices might be used. In addition to green social work techniques, inclusive technology incorporates a participatory framework that raises awareness, increases the capacity of stakeholders, improves environmental justice and consciousness, and fosters advocacy, policy-making, environmental stewardship, equity, and engagement.

***Key words**: Community awareness, social work, biotechnology, environment, and capacity building.*

SILVER NANOPARTICLES SYNTHESIZED FROM CUCURBITA PEPO SEED EXTRACT: A GREEN ROUTE TO MICROBIAL CONTROL

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Abstract:

This study reports the green synthesis, characterization, and antimicrobial potential of silver nanoparticles (AgNPs) fabricated using Cucurbita pepo seed extract. Phytochemical analysis revealed a metabolite-rich profile dominated by phenolic compounds (++), along with alkaloids, terpenoids, saponins, and cardiac glycosides (+), facilitating efficient Ag^{+} reduction and nanoparticle stabilization. GC–MS profiling identified long-chain fatty acids predominantly cis-vaccenic acid (66.52%), palmitic acid (19.81%), and stearic acid (10.39%)—as major stabilizing constituents. FTIR spectroscopy confirmed the involvement of functional groups in nanoparticle capping, while UV–Vis analysis exhibited a characteristic surface plasmon resonance peak at 417 nm, indicating successful nanoparticle formation. The biosynthesized AgNPs demonstrated enhanced antibacterial and antifungal activity against Staphylococcus aureus, Klebsiella pneumoniae, and Aspergillus niger compared to the crude extract. This work aligns with Sustainable Development Goals by contributing to SDG 3 (Good Health and Well-Being) through combating antimicrobial resistance, SDG 9 (Industry, Innovation and Infrastructure) via green nanotechnology, SDG 12 (Responsible Consumption and Production) through sustainable synthesis, and SDG 15 (Life on Land) by reducing chemical toxicity.

Keywords*: Antimicrobial, Cucurbita pepo, green synthesis, SDG-9, SDG-12, SDG-15.*

ICT-Driven Cities

D.ABINAYA
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Abstract

The purpose of the study is to investigate and address the challenges posed by rapid population growth in urban cities. The study aims to explore how Information and Communication Technologies (ICT) can be leveraged to advance the concept of smart cities. Specifically, it seeks to understand how the integration of ICT can contribute to enhancing urban resilience, promoting urban sustainability and improving Citizen`s quality of life. The study relied on case study analysis and literature review covering each continent of the world to ensure a global perspective. Subsequently, thematic analysis investigated the key benefits of smart cities. By deploying sensors, data analytics, and high-speed connectivity, these cities manage resources like energy, traffic, and waste in real-time. This digital foundation enables responsive governance and creates more resilient, efficient, and inclusive urban environments. This study offers a global perspective on integrating ICT for urban resilience and sustainability, categorizes fifteen smart city software applications, addresses urbanization challenges, and aligns thirty-one benefits with smart city action areas, providing a comprehensive framework for urban development stakeholders.

Keywords *– Smart Cities, Smart City Software, Sustainability, Resilience, Information and Communication Technologies, Internet of Things.*

CONFERENCE PROCEEDING

INTERNATIONAL CONFERENCE ON SMART INNOVATION TECHNOLOGIES & ARTIFICIAL INTELLIGENCE FOR SUSTAINABLE DEVELOPMENT (ICSAS-2026)

ABOUT THE COLLEGE

St.Joseph's College (Arts & Science) is a co-educational Christian institution run by the management of Society for Education for Life. This college has been established in 1994 and has been taken over by **Rev.Fr.Dr.J.E.Arul Raj** and managed by DMI Sisters from 2004. This college is Approved by Govt. of Tamilnadu, Affiliated to University of Madras, Accredited by **NAAC with "A" Grade, 2(f) Status of UGC Act,1956 and ISO 21001:2018 Certified Institution.** DMI is known for its time-honourable tradition of imparting quality education to the society and rendering social service without discrimination.

Rev.Fr.Dr.J.E.Arul Raj is the Founder and Chairman of the college. He is ably supported by **Rev.Sr.S.Lalitha**, Superior General of DMI and **Rev.Sr.S.Gnanaselvam**, Managing Trustee of the society. The vision of the college is to provide a discipline life with a spiritual base to remain **'Fully Alive and Fully Human'**. Further, it strives to achieve excellence and provides opportunities to the students to achieve technical excellence.

VISION

To emerge as an institute of excellence by imparting quality higher education to the youth, not only focused on imparting subject knowledge and skills, but also to mould the students with better conduct and character, committed to the societal needs and national development.

MISSION

To be innovative, inclusive and committed to excellence in teaching, research and knowledge transfer and to serve the social, cultural and economic needs of the Society To innovate and offer educational programmes in various disciplines with synergistic interaction with the industry and society To impart knowledge and skills to students equipping them to be ready to face the emerging challenges to the knowledge area To provide equal opportunity to women students and prepare them to be equal partners in meeting the scientific and technological demands of the nation To provide opportunity for the rural and underprivileged students to get collegiate education and make the first generation learners graduate and employable.

CONFERENCE THEME

Smart Innovation Technologies and Artificial Intelligence for Sustainable Development ICSAS-2026 focuses on the transformative role of smart innovation technologies and artificial intelligence in achieving sustainable development across economic, environmental, and social dimensions. The conference provides a global platform for researchers, industry experts,policymakers, and practitioners to exchange ideas on AI-driven solutions, intelligent systems, data analytics, automation, and emerging digital technologies that support sustainable industries, smart cities, renewable energy, healthcare, education, and governance. Emphasis is placed on ethical and responsible AI, digital inclusion, resilience, and innovation strategies aligned with global sustainability goals, fostering interdisciplinary collaboration to address pressing global challenges and shape a sustainable future.

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