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# FACULTY PUBLICATION

RESEARCH PAPERS

May-2025

## TITLE:

Investigating the interaction of a cosmic string  
with an accreting black hole

## AUTHOR :

Swamy I.; Singh D.

## JOURNAL NAME:

Physica Scripta (Vol.-100, Issue-6)

## DETAILS:

Published on 14 May 2025



## ABSTRACT:

Rotating black holes when attached to a cosmic string have their rotational energy extracted leading to a change in its spin and mass. The spin of a black hole can be measured using various methods for an accreting black hole in an x-ray binary system. Accretion disks around black holes have an innermost stable circular orbit (ISCO) whose location is directly dependent on spin and mass of the black hole. The orbit's location changes as the black hole's spin changes and hence can be a method to detect the presence of cosmic strings. This study investigates this change and suggests the ejection of accretion material as black hole spin approaches maximum for prograde motion and material falling into the black hole for retrograde motion, regardless of the presence of cosmic string. However, in the presence of cosmic string, the spin-up process due to accretion is found out to be slower, even with high accretion rates and is detectable. There is a transition phase that occurs as the black hole approaches maximum spin, where even small changes in spin result in significant changes in the ISCO's position. Accreting black holes attached to a large string never reach this transition phase and this absence serves as potential evidence for the existence of a cosmic string.

Link:

[https://ui.adsabs.harvard.edu/link\\_gateway/2025PhyS..100f5008S/doi:10.1088/1402-4896/adce49](https://ui.adsabs.harvard.edu/link_gateway/2025PhyS..100f5008S/doi:10.1088/1402-4896/adce49)



### TITLE:

Degradation of aniline blue dye in aqueous solution using ozonation as advanced oxidation process: Optimization and mechanism

### AUTHOR :

Bhawsar A.; Bhutada D.; Ghuge S.

### JOURNAL NAME:

Journal of the Indian Chemical Society (Vol.-102, Issue-6)

### DETAILS:

Published on May 2025



### ABSTRACT:

Aniline blue dye is widely used in various fields, including textile dyeing, biotechnological processes, and analytical chemistry research. However, its release into the environment without proper treatment can have serious adverse effects on human health and the ecosystem, emphasizing the need for effective management and remediation strategies. A limited number of studies are available in the literature employing advanced oxidation processes (AOPs) for the mineralization of aniline blue dye. Therefore, the present work explores ozonation as one of the AOPs to study the degradation aniline blue dye in aqueous solution. The experimental parameters like initial dye concentration, inlet ozone dose and initial dye solution pH were optimized in order to maximize aniline blue dye degradation efficiency. The direct and indirect degradation pathways were analyzed using t-butanol as a radical scavenger. The maximum degradation efficiency of 81.1 % was achieved at optimal experimental conditions of initial dye concentration of 250 mg/L, inlet ozone dose of 18g/h and initial dye solution pH 11 after 30 min of ozonation. The complete colour removal was observed after 15 min of ozonation at the optimized experimental conditions. The presence of radical scavenger t-butanol had no impact on colour removal efficiency indicating direct ozone molecule mechanism. However, COD removal efficiency was decreased with the addition of radical scavenger t-butanol suggesting indirect hydroxyl radical based mechanism. The experimental results suggested that ozonation is an effective and promising method for the degradation of aniline blue dye in aqueous solution, showcasing significant potential for its application in wastewater treatment.

Link: <https://doi.org/10.1016/j.jics.2025.101742>



## TITLE:

Predictive Modeling of Genetic Diseases: A  
Comparison of Various Machine Learning  
Approaches

## AUTHOR :

Sinha R.; Kulkarni P.V.

## JOURNAL NAME:

Communications in Computer and Information  
Science (Vol.-2426CCIS)

## DETAILS:

Published on 22 April 2025



## ABSTRACT:

The aim of this research is to improve the prediction of genetic disorder types by employing large patient data and comparing several machine learning algorithms like XGBoost, Random Forest, AdaBoost, and k-Nearest Neighbors. The study's goal is to enhance our understanding of the underlying patterns and factors contributing to various genetic disorders by analyzing a large dataset. To improve prediction accuracy, the study uses feature selection and dimensionality reduction techniques like Recursive Feature Elimination, Pearson Correlation, and Kendall feature selection. Principal Component Analysis (PCA) and t-distributed Stochastic Neighbor Embedding (t-SNE) simplify the data without losing vital details. The primary goal is to develop a robust and interpretable predictive model for genetic disorders. When the XGBoost Classifier was used with Recursive Feature Elimination, the highest accuracy of 82% was achieved. This research aims to determine the best methods for early detection and personalized treatment planning in clinical settings by thoroughly analyzing several machine learning approaches. Enhancing our capacity to anticipate genetic condition types provides healthcare professionals with useful insights, potentially leading to more tailored and successful treatment options for patients. This approach combines modern machine learning techniques with domain-specific expertise to address the complex issue of predicting the type of genetic disorders.

Link: [https://doi.org/10.1007/978-3-031-86296-0\\_20](https://doi.org/10.1007/978-3-031-86296-0_20)



## **TITLE:**

Toxicological Aspects of PROTACs

## **AUTHOR :**

Pujari R.; Soni U.

## **JOURNAL NAME:**

PROTAC-Mediated Protein Degradation: A  
Paradigm Shift in Cancer Therapeutics

## **DETAILS:**

Published on September 2024



## **ABSTRACT:**

The present chapter provides an in-depth exploration of PROTACs, a unique class of drug-like compounds that induce targeted protein degradation within cells. It discusses the novel mechanism of action of PROTACs compared to traditional small-molecule inhibitors, highlighting their potential to target a wide range of proteins, including previously “undruggable” ones. The chapter emphasizes the importance of thorough safety evaluations in the development of PROTAC-based therapies, addressing challenges such as off-target effects, immunogenicity, and cytotoxicity. By examining the toxicological studies conducted on PROTACs, the chapter underscores the critical need to assess and mitigate potential toxicity issues to ensure the safety and efficacy of these promising molecules in therapeutic applications.

Link: [https://link.springer.com/chapter/10.1007/978-981-97-5077-1\\_10](https://link.springer.com/chapter/10.1007/978-981-97-5077-1_10)





## TITLE:

Blockchain-Driven Automation for Degree  
Certificate Authentication While Preserving Data  
Integrity

## AUTHOR :

Bhamare M.; Kulkarni P.V.; Purnaye P.; Kulkarni  
V.; Patil K.; Thokal V.

## JOURNAL NAME:

Proceedings - 2024 International Conference on  
Progressive Innovations in Intelligent Systems  
and Data Science, ICPIDS 2024

## DETAILS:

Published on 29 April 2025



## ABSTRACT:

Academic records are constantly at risk of varying attacks which impede traditional methods because they implement manual processes and web services, something that SAC has already underlined as a threat. In this research, an endeavor has been made to investigate the way blockchain technology is benefiting certificate authentication and verification of degree certificates. This research paper develops a solution for using smart contracts on the Ethereum blockchain to prove the security, transferability, and validity of advanced certificates. This helps to validate student academic records securely. The information about the same is kept in a hashed pattern on a blockchain for the verification process so that it is tamper-free. Application of this method delivers a safe, reliable and scalable answer for schools to authenticate & handle academic credentials.

Link: <https://doi.org/10.1109/ICPIDS65698.2024.00050>



## TITLE:

Blockchain-Enabled IoT System for Real-Time  
Diabetes Monitoring and Management

## AUTHOR :

Apte M.; Chavali M.; Apte S.; Kale B.

## JOURNAL NAME:

Proceedings of 2025 AI-Driven Smart Healthcare  
for Society 5.0, AdSoc5.0 2025

## DETAILS:

Published on 16 April 2025



## ABSTRACT:

This study introduces an innovative diabetes monitoring system based on the IoT that utilizes blockchain technology to enhance security and data privacy. The system employs IoT devices like glucose sensors, pulse oximeters, glucose meters and wearable health monitors to continuously gather real-time data on blood glucose levels and other pertinent health metrics from diabetic individuals. The collected data is securely transmitted and stored on a blockchain network, ensuring data integrity and preventing tampering or unauthorized access. Smart contracts enforce access control policies, permitting only authorized healthcare providers and patients to access and manage stored data. The proposed framework incorporates mechanisms for data anonymization and aggregation, safeguarding individual privacy while preserving the usefulness of shared data for research purposes. The framework's efficacy and feasibility in facilitating secure and privacy-preserving data sharing for pharmaceutical research and development in the diabetes management field are demonstrated through a comprehensive evaluation, encompassing performance analysis, regulatory compliance assessment, and use case scenarios.

Link:

<https://doi.org/10.1109/IEEECONF64992.2025.10962809>





## TITLE:

Implementation of Parallel Computing with Artificial Intelligence in Big Data Analytics

## AUTHOR :

Bhagat D.; Dhawas P.; Dhawale K.; Rewatkar R.

## JOURNAL NAME:

Parallel and High-Performance Computing in Artificial Intelligence (Book Chapter)

## DETAILS:

Published on 2025



## ABSTRACT:

The exponential development of data, big data analytics, has become increasingly important for businesses and administrations. However, analyzing massive amounts of data can be time consuming and computationally intensive. Parallel computing and artificial intelligence can be used to address these challenges and enhance the efficiency and accuracy of big data analytics.

Link: <https://doi.org/10.1201/9781003425458-5>



## TITLE:

Use of NLP Techniques and High-Performance Computing for Automated Knowledge Based Ontology Construction of Saffron Crop

## AUTHOR :

Joshi M.S.; Pangave V.V.

## JOURNAL NAME:

Parallel and High-Performance Computing in Artificial Intelligence (Book Chapter)

## DETAILS:

Published on April 2025



## ABSTRACT:

The agriculture industry is very different from other industries, as it depends on many natural and climatic factors. Revolutionary changes are shaking up the way farming is done and opening up new opportunities and challenges. The amount of user-generated information about smart farming, green houses, and indoor farming that is available on the web keeps growing. Learning how to represent language and solve tasks from beginning to end without the help of human experts to extract and create features has made approaches more precise and much more challenging in terms of the number of parameters. This means that they need parallelized and distributed resources for high-performance computing. This chapter gives a knowledge-based representation of the most recent problems, algorithms, and models in the field of agriculture that involve natural language processing. Mainly we consider saffron crop cultivation. Additionally, the impact of high-performance computing for natural language processing (NLP) applications is shown by going into detail about deep learning approaches that use large amounts of data to train models before using them to understand text. In the proposed method, NLP techniques are used to prepare the data; rule-based formal concept analysis and mapping are used to analyze and map the tags that have been reduced; and finally weather, pests, and soil subdomain ontologies are built separately from the saffron agricultural domain data.

.Link: <http://dx.doi.org/10.1201/9781003425458-10>



## TITLE:

Tangled Connection of Gut Microbiome and  
Alzheimer's Disease

1

## AUTHOR :

Pujari R.; Shilpi S.; Dua K.; Sharma S.; Bhatt S.

## JOURNAL NAME:

Neuro-Nutraceuticals and Drug Discovery and  
Delivery in Alzheimer's Disease: Targeting Key  
Pathological Pathways: Volume (Book Chapter)

## DETAILS:

Published on January 2025



## ABSTRACT:

Several preclinical and clinical investigations have proved that the human gut microbiome plays a crucial role in the pathobiology of central nervous system (CNS) disorders. Recent studies suggest correlations between the altered gut microbiota and major Alzheimer's Disease (AD). AD is characterized by the formation of A $\beta$  plaques and neurofibrillary tangles. It is proposed that normalization of the gut microbiota alleviates AD. The imbalance in levels of normal gut microbiota has a crucial role in the pathogenesis of AD. Treatment strategies with certain antibiotics lead to the depletion of useful microbes and thereby induce AD-like effects in subjects. The microbiota is also involved in the synthesis of various neurotransmitters (NTs) like acetylcholine (ACh), 5-hydroxytryptamine (5-HT; serotonin), norepinephrine (NE), and dopamine (DA). Probiotics, prebiotics, synbiotics, and a healthy diet have been found to have positive benefits in controlling the etiology of AD. The control of brain-gut microbiota is developing as a potential AD therapy approach in light of the history of the limited therapeutic advantages of cholinesterase inhibitors. The importance of the brain-gut-microbiota axis in the development of AD is discussed in detail in this review, with an emphasis on the regulation of the gut microbiota as an important intervention for the treatment of AD.

Link: <http://dx.doi.org/10.1201/9781003570356-3>



## TITLE:

Improvement of properties in recycled glass-filled polypropylene using novel blend technology

## AUTHOR :

Radhakrishnan S.; Neve H.; Nirmal A.; Waghela D.; Sangwai J.; Chavan H.

## JOURNAL NAME:

Polymer Engineering and Science

## DETAILS:

Published on 9 May 2025



## ABSTRACT:

The work deals with improving the properties of waste plastics generated from the automobile and polymer-compounding industries by appropriate blend technology without the use of virgin polymers. Two recycled grade plastics, namely glass-filled polypropylene (r-PPGF) and glass-filled nylon (r-PA66GF), were blended with and without compatibilizer. The blends were further investigated for their mechanical, thermal, and morphological properties. Considerable improvement in the tensile strength, flexural strength, and impact resistance has been obtained when r-PPGF was blended with r-PA66GF. Even by adding 10 wt% of r-PA66GF, the tensile and flexural strength was found to be almost 1.5 times that obtained in recycled glass-filled PP. The effect of maleic anhydride grafted PP as compatibilizer was positive for improved tensile and flexural strength while negative for impact properties. The addition of impact modifier was also studied in the blend compositions, indicating a slight improvement in impact strength but a decrease in tensile and flexural strength values. DSC results reveal the cumulative effect of the glass fibers, additives, and r-PA66GF on the uplifting of the crystallization temperature of the major matrix: r-PP-GF. Morphology study shows the agglomeration of polymer fibers after adding the impact modifier.

Link: <https://doi.org/10.1002/pen.27248>



## TITLE:

Reviving the Indigenous Knowledge System (IKS) for Nutrition

## AUTHOR :

Shamim M.Z.; Matin A.; Nigadkar M.P.; Sharma U.; Hussain A.; Ain N.

## JOURNAL NAME:

Advancing Global Food Security With Agriculture 4.0 and 5.0

## DETAILS:

Published on April 2025



## ABSTRACT:

Supplemental pills and syrups are frequently consumed in modern India, notably by the nation's growing new middle class. Vested pharmaceutical interests promote the remarkable uptake of dietary supplements. It is an irony that indigenous knowledge system has been disdained in relation to modern knowledge system owing to its hegemony and power relations. In contrast to nutrient-dense medications, this paper makes an attempt to examine the nutritional benefits of locally available, easily accessible items. However, these indigenous resources are grossly underutilized due to lack of an inadequate knowledge system and logistic support. The proposed indigenous knowledge system must be rigorously and scientifically scrutinized for its validation in addressing the nutritional value of items and its accessibility by the excluded sections of the society in pursuit of inclusive policy for a healthy society.

Link: <http://dx.doi.org/10.4018/979-8-3693-9964-4.ch010>



## TITLE:

Fuel Consumption Optimization in Solid Oxide Fuel Cell Based Hybrid Electric Tractor Using Multihead Cross Attention and Sea-Horse Optimization

## AUTHOR :

Ahuja A.; Waghole D.; Ramdasi S.S.

## JOURNAL NAME:

Optimal Control Applications and Methods

## DETAILS:

Published on 23 April 2025



## ABSTRACT:

In the research, improving the efficiency and reducing fuel consumption in Solid Oxide Fuel Cell-based Hybrid Electric Tractors (SOFC-HET) by employing a hybrid approach is proposed. The proposed strategy is the Evolved Multihead Cross Attention based Bidirectional long short-term memory Network (EMCABN). For enhancing the precision of EMCABN predictions, Sea-Horse Optimizer (SHO) is introduced. EMCABN is employed in the prediction of the tractor power demand and the operational status of the fuel cell. SHO directly focuses on optimizing the control parameters associated with power distribution, fuel flow, air flow, and temperature to minimize fuel consumption effectively. The input parameters to be optimized are SOFC nominal power, battery capacity, hydrogen consumption, cost of electricity, and so forth. For validation, the system is tested under the MATLAB platform and compared with other approaches. Under the proposed technique, the hydrogen tank capacity during plowing with initial State of Charge (SOC) levels of 40%, 65%, and 90% is 6.457 kg.

Link: <https://doi.org/10.1002/oca.3289>



## TITLE:

Enhancing Performance and Security Measures  
in Modern Automated Environments

## AUTHOR :

Bahadure N.B.; Patil P.D.; Routray S.; Mattada  
M.P.

## JOURNAL NAME:

AIP Conference Proceedings (Vol.-3278, Issue-  
1)

## DETAILS:

Published on 17 April 2025



## ABSTRACT:

This is the age of automation and digitization, and human life is getting simpler and easier because of automation, as almost everything is becoming automatic. These automatic systems are replacing manual systems. The Internet is becoming an integral and important part of daily life; many things are useless without it. Also, with the advent of new advances in wireless communication technologies like Bluetooth, Wi-Fi, LoRa, Zigbee, WiMax, etc., it is possible to connect electronic devices for control & information exchange; these devices can be controlled and operated by any authorized person across all network infrastructure. In the present work, our concentration has been on home automation systems powered by the Internet of Things. Present work used an Arduino Uno board, which is also integrated with Node MCU ESP8266 as a web server for information exchange and providing remote access to the devices. The proposed system can control and handle the electronic, electrical, and mechanical systems that can automate tasks and provide home or building security. To add features, various types of sensors, such as an MQ6 sensor to detect gas leakage, a magnetic switch to check the status of the main door, and a buzzer to inform if there is an emergency to provide security breach. A water level sensor is also provided to detect the water level in the tank. The devices can be controlled by the authorized person accessing the web server after validating and authenticating the person. The parameters from the sensors are also uploaded over the cloud for analytics. The systems' performance is rigorously studied, calibrated, and evaluated for the authentication and validation of the proposed system.

Link: <https://doi.org/10.1063/5.0262100>



## TITLE:

Distorted 2H/1T MoS<sub>2</sub> nanostructures with improved field emission and sodium-ion battery performance

## AUTHOR :

Chothe U.; Sumbe P.; More M.A.; Chavali M.;  
Kulkarni M.V.; Kale B.B.

## JOURNAL NAME:

Nanoscale Advances

## DETAILS:

Published on 16 April 2025



## ABSTRACT:

The present investigation demonstrates a facile and scalable synthesis strategy for the preparation of 2H and 1T phases of MoS<sub>2</sub> using a solid-state method. Our findings reveal that MoS<sub>2</sub> exhibits a distorted octahedral coordination structure, formed owing to the thiourea concentration. The structural transitions from the semiconducting 2H phase to the metallic 1T phase have been confirmed by XRD and Raman spectroscopy. The resulting MoS<sub>2</sub> (1T) can provide more active sites by forming an ultrathin monolayer with a thickness of a few nanometers, enhancing the electrical conductivity. Field electron emission (FEE) behavior was investigated at a base pressure of  $1 \times 10^{-8}$  mbar. The utmost emission current density i.e.  $820 \mu\text{A cm}^{-2}$  was observed for the 1T MoS<sub>2</sub> emitter at an applied field of  $4.56 \text{ V } \mu\text{m}^{-1}$ , in comparison to 2H MoS<sub>2</sub>, which showed  $542 \mu\text{A cm}^{-2}$  at  $4.85 \text{ V } \mu\text{m}^{-1}$ . Considering the good electrical conductivity and layered ultrathin sheet structure, 1T MoS<sub>2</sub> has been explored as an anode for SIBs. Interestingly, it delivered a reversible capacity of  $870 \text{ mA h g}^{-1}$  at  $100 \text{ mA g}^{-1}$ , and good cycling performance at  $200 \text{ mA g}^{-1}$  with 81% retention after 300 cycles. By integrating MoS<sub>2</sub> electrodes with glyme electrolytes, a synergistic effect is achieved, leading to stable electrochemical performance of SIBs. The existence of an active 1T-MoS<sub>2</sub> basal plane compared to 2H-MoS<sub>2</sub> is responsible for the noticeable field electron emission and SIB application. It is noteworthy that MoS<sub>2</sub> without any modifications (such as doping, carbon integration or composite formation) showed excellent performance in both applications. This paper underscores MoS<sub>2</sub>'s versatility and promising avenues for revolutionizing electronic devices and energy storage technologies.

Link: <https://doi.org/10.1039/D5NA00004A>





## TITLE:

Synergizing Cybersecurity and Neuro-imaging Biomarkers Innovations in Deep Learning for Diagnosis and Progression Monitoring

## AUTHOR :

Manimaran M.; Sridhar D.; Manikandan K.B.;  
Devaraju S.; Thirumalai Raja K.

## JOURNAL NAME:

Cybersecurity in Healthcare Applications (Book Chapter)

## DETAILS:

Published on January 2025



## ABSTRACT:

In today's interconnected digital environment, cybersecurity is a major concern and threats occur at an incredible rate and frequency. This study explores the potential of synergies between cybersecurity and neuro-imaging biomarkers, harnessing the potential of deep learning techniques for diagnosis and developmental monitoring. The study defines a new technique and application paradigm for cybersecurity by improving treatment detection and optimizing response capabilities. This chapter highlights the transformative impact of incorporating neuro-imaging biomarkers and deep learning into the cybersecurity paradigm for in-depth analysis. Globally, cyberattacks play an important role from simple hacking attempts to complex malware insertions, threatening the integrity, privacy, and availability of data and systems. Traditional approaches to cybersecurity struggle to keep pace with the evolution of cyber threats. There was an urgent need for innovations which can adapt and solve emerging challenges in real time by using various advanced techniques and incrementally exploiting more vulnerabilities. There was a new path between cybersecurity and neuro-imaging biomarkers, where cutting-edge techniques from neuroscience and machine learning are combined to deliver new insights and capabilities. The neuro-imaging biomarker was derived from neuro-imaging techniques such as positron emission tomography (PET), magnetic resonance imaging (MRI), and functional magnetic resonance imaging (fMRI) which provide valuable information about brain structure and function.

Link: <http://dx.doi.org/10.1201/9781032711379-6>



## TITLE:

Exploring the Effectiveness of Polypropylene  
Fiber-Reinforced Geo-Polymer Concrete

## AUTHOR :

Sathe S.; Pawar C.U.

## JOURNAL NAME:

Journal of Mines, Metals and Fuels (Vol.-73,  
Issue-4)

## DETAILS:

Published on April 2025



## ABSTRACT:

This research explored the effectiveness of Polypropylene Fibers (PPF) in Industrial Fly Ash (IFA) based Geopolymer Concrete (GPC). The GPC of M40 grade was incorporated with different PPF capacities (0.2%, 0.4%, and 0.6% by weight of concrete) and assessed its performance involved mechanical and durability properties and compared with Conventional Concrete (CC) of the same grade. Mechanical properties like Compressive Strength (CS), Split Tensile Strength (STS), and Modulus of Elasticity (MOE), were assessed. Also, Rapid Chloride Penetration Test (RCPT), water permeability, and carbonation tests were directed to assess the durability features of GPC. The study demonstrated that PPF-reinforced GPC exhibited higher CS, STS, better resistance to chloride penetration, lower water permeability, and reduced carbonation compared to CC of the same grade making it a promising alternative to CC with certain advantages and disadvantages. Also, the obtained experimental results and behaviour of GPC with PPF examine the influence of different dosages of PPF on the mechanical and durability characteristics. Major Findings: Compared to CC, GPC exhibited notable enhancements in mechanical properties. Compressive strength increased by 4.34-10.20 %, split tensile strength by 13.04-21.56 %, and modulus of elasticity by 24.27-31.73 % after 28 days of curing.

Link: <https://doi.org/10.18311/jmmf/2025/47428>



## TITLE:

Economical Heuristics For Fully Interval Integer  
Multi-Objective Fuzzy And Non-Fuzzy  
Transportation Problems

## AUTHOR :

Baranwal T.; Akilbasha A.

## JOURNAL NAME:

Yugoslav Journal of Operations Research (Vol.-  
34, Issue-4)

## DETAILS:

Published on January 2024



## ABSTRACT:

The single-objective fuzzy or non-fuzzy transportation problem (TP) is not capable of dealing with real-life decision-making problems due to our current competitive market state. In this article, we investigate a fully integer interval multiobjective transportation problem (FIIMOTP) and a fully fuzzy integer multi-objective transportation problem (FFIMOTP). We also provide two solution approaches for solving the FIIMOTP and FFIMOTP. Numerical examples are provided to validate these two approaches. Our results show that the proposed algorithm hugely outperforms the best solution approaches.

Link: <https://doi.org/10.2298/YJOR240115035B>



## TITLE:

A Comprehensive Review of Emotion Recognition Using Multimedia Parameters: Challenges, Computational Intelligence and Applications

## AUTHOR :

Shah A.K.; Kadyan V.; Kane L.

## JOURNAL NAME:

SN Computer Science (vol.-6, Issue-5)

## DETAILS:

Published on 8 May 2025



## ABSTRACT:

Advancement in human-computer interactions (HCI) demands optimized systems that depend on devising fast and reliable human emotion recognition algorithms. Images, audio, sensory physiological signals, and body gestures are some of the identified principal modalities that characterize human emotions. However, the fusion of different modalities (homogeneous and heterogeneous) towards emotion recognition is challenging research where the space of diversities in different modalities are explored. Apart from dimensionality reduction schemes, fitting feature extraction methods, and fusion through models are some challenges which impact the performance of HCI systems. With the capability of processing unstructured data and real-time system designs, various neural networks have been reported to be the preferable choice for development of a multimodal emotion recognition system. This paper presents a comprehensive review on emotion recognition works based on image, audio, and physiological modalities. It begins with a discussion on various emotions and their interpretation with the said modalities. Further, emotion recognition works have been explored in terms of established and crafted emotion features. Later features extraction techniques that range from general machine learning based schemes to the recent deep neural networks are presented. Consequently, the performance of various emotion recognition schemes has been reviewed for individual and multi modalities-based systems. This performance review goes higher for the models based on various modality fusions, i.e., audio-video, audio-text, and body gestures. The fusion schemes mentioned here have been analyzed keeping in mind the efficacy of modality combinations towards each human emotion recognition.

Link: <http://dx.doi.org/10.1007/s42979-025-03861-1>



## TITLE:

Do Agricultural Extension Services Really Matter to Indian Farmers? Evidence from Situation Assessment Survey on Farmers

## AUTHOR :

Biradar J.; Deo S.; Kaur S.

## JOURNAL NAME:

Indian Economic Journal

## DETAILS:

Published on 9 May 2025



## ABSTRACT:

To attain the goal of doubling farmers' income, technical advice and adoption play a crucial role in the Indian agriculture sector. Because of the modernisation of Indian agriculture and the easy availability of advanced technology, farmers are taking technical advice and new advanced technological information from several sources to increase productivity and their income. An attempt has been made in this study to understand the changes in access and adoption of agriculture extension services in India. The national representative unit-level data have been taken from the National Sample Survey Organisation (NSSO) 77th round (2019) on 'Land and Livestock Holdings of Households and Situation Assessment of Agricultural Households'. The logistic regression is used, considering binary nature of dependent variable, to understand the changes in 'access' and 'adoption' of agriculture extension services in India. The study found that the level of education, training to farmers, awareness about minimum support price (MSP), registered members of farmer's organisation and farm size are significant factors influencing the access to technical advice whereas the household size, farmers belonging to lower social groups and use of information and communication technology (ICT) are major factors influencing the adoption of technical advice in Indian farming community. Based on the results of the study, it is recommended that decision makers should focus more on farmers having limited assets and belonging to lower social groups to increase the adoption of new technology with affordable prices. There is a need to provide basic infrastructure facilities which will increase the adoption of modern technology among the farming community. JEL Codes: Q1, O3, R2

Link: <https://doi.org/10.1177/00194662251332867>



## TITLE:

Electrospun Nanofiber-Reinforced Polymer Composites and Their Advanced Applications

## AUTHOR :

Gavande V.; Shaikh V.; Lee W.-K.

## JOURNAL NAME:

Specialty Polymers and Materials: Advances, Technologies, Applications, and Future Trends

## DETAILS:

Published on January 2025



## ABSTRACT:

Electrospun nanofibers have devoted enormous efforts in the fields of biomedical, sensors, soft electronics, artificial tissues, energy storage and conversion, and membrane and separation industries owing to their promising advantages and superior properties in stretchability, conductivity, molecular orientation, and excellent mechanical performance. The scalability and repeatability of the aforementioned techniques face significant challenges due to physical and economic constraints, along with the intricate procedures required in the fabrication of nanomaterials. These limitations are becoming more apparent with time. Electrospinning is an efficient and cost-effective method that produces one-dimensional nanostructures with high surface area, porosity, continuity, and various fibrous morphologies. These features make electrospun nanofibers highly desirable for use in next-generation polymer nanocomposites. By uniformly dispersing nanofibers throughout the composite matrix, electrospun nanofiber-reinforced polymer composites (ENRPCs) offer enhanced optical, thermal, and mechanical properties, including tensile strength, stiffness, and toughness. Highly aligned and ultrafine fibers produced by electrospinning can be woven into different structures such as mats, sheets, or directly embedded, and integrated into composite materials. This chapter provides an overview of the recent developments in ENRPCs, with potential applications and future challenges discussed to inspire academic and industrial interest.

Link: <http://dx.doi.org/10.1201/9781003561361-8>



## TITLE:

Fault-Aware Test Case Prioritization in Software Testing Using Jaya Archimedes Optimization Algorithm

## AUTHOR :

Sugave S.R.; Kulkarni Y.R.; Jagdale B.; Gutte V.

## JOURNAL NAME:

Journal of Electronic Testing: Theory and Applications (JETTA) (Vol.-41, Issue-1)

## DETAILS:

Published on 30 April 2025



## ABSTRACT:

Test case prioritization is aimed at detecting the fault as early as possible which is largely employed in program regression testing. The previous test case prioritization schemes are affected by the lower capability to predict the faults and incur more computational overhead. To bridge this gap, a novel framework Jaya Archimedes Optimization Algorithm (Jaya AOA) is developed for test case prioritization. Two phases involved in this model are test case generation and test case prioritization. Initially, the software program is applied to the test case generation. After that, the generated test cases are applied to the test case prioritization, which is prioritized by the Jaya AOA model. Here, Jaya AOA is the combination of the Jaya Algorithm (Jaya) and Archimedes Optimization Algorithm (AOA). Two objectives are considered during prioritization are Average Percentage of Fault Detected (APFD), and the Average Percentage of Branch Coverage (APBC). APFD is the weighted average of the percentage of faults identified throughout the duration of a test suite. APBC is defined as the weighted average of the percentage of branches covered over the lifespan of a test suite. The evaluation metrics employed in this scheme Average Percentage of Fault Detected (APFD), Average Percentage of Branch Coverage (APBC), Average percentage of decision covered (APDC), Percentage of Remaining Fault Detected (PRFD), and Rate of Remaining Fault detection (RRTF) acquired maximum value of 0.934, 0.968 0.932, 0.941, and 0.943 in space.

Link: <https://doi.org/10.1007/s10836-025-06157-7>



## TITLE:

Investigation of Stiffness Derivatives of a Wedge for Varying Wedge Angles and Pivot Positions at Hypersonic Mach Numbers

## AUTHOR :

Shaikh J.S.; Kumar K.; Pathan K.A.; Khan S.A.; Siddiqui A.; Garg S.

## JOURNAL NAME:

Journal of Advanced Research in Applied Mechanics (Vol.-135, Issue-1)

## DETAILS:

Published on April 2025



## ABSTRACT:

The current investigation focuses on numerically simulating the stiffness derivative across a wedge by varying Mach numbers and wedge angles at different pivot points. The simulation of the stiffness derivative utilizes an approach based on regression model analysis. The analytical results draw upon Ghosh's two-dimensional piston theory. This research considers the Mach number, wedge angle, and pivot position as factors. This study's Mach number ( $M$ ) ranges from 5.0 to 10.0 while the wedge angle ( $\theta$ ) varies between  $3^\circ$  and  $30^\circ$ . The stiffness derivative findings are obtained for Mach numbers ( $M$ ) and angles of incidence ( $\theta$ ) at several pivot positions ( $h$ ) spanning from 0.0 to 1.0. The findings of this study regarding stiffness derivatives are compared to the analytical results. There is a strong alignment between the current research results and the analytical findings. It is observed that parameters such as pivot position ( $h$ ), wedge angle ( $\theta$ ), and Mach number ( $M$ ) play a significant role in influencing the variations of the stiffness derivative. The stiffness derivative consistently increases with the angle of incidence ( $\theta$ ) and decreases steadily as the Mach number ( $M$ ) increases at each pivot location ( $h$ ).

Link: <https://doi.org/10.37934/aram.135.1.193205>



## TITLE:

Evaluation of Stiffness Derivatives of a Wedge at  
Supersonic Speeds using Design of Experiment  
Methodology

## AUTHOR :

Shaikh J.S.; Kumar K.; Pathan K.A.; Khan S.A.;  
Siddiqui A.

## JOURNAL NAME:

Journal of Advanced Research in Applied  
Mechanics (Vol.-135, Issue-1)

## DETAILS:

Published on April 2025



## ABSTRACT:

The current research focuses on numerically simulating the stiffness derivative across the wedge for various supersonic Mach numbers and wedge angles at different pivot points. The knowledge of the stiffness derivatives is of prime importance from the stability point of view. The stiffness derivative is a measure of the stability of aerospace vehicles. The regression model analysis method is applied for the numerical simulation of the stiffness derivative. The analytical results are derived by applying Ghosh's two-dimensional piston theory. The factors Mach number, wedge angle, and pivot position are considered for the current investigation. For the current study, the Mach number ( $M$ ) ranges from 2.2 to 4.0, and the wedge angle ( $\theta$ ) differs from  $2^\circ$  to  $20^\circ$ . The stiffness derivative findings are obtained for different Mach numbers ( $M$ ) and angle of incidence ( $\theta$ ) at pivot various positions ( $h$ ) spanning the range of 0.0 to 1.0. The present study's conclusions on stiffness derivatives are contrasted with the analytical findings. Excellent consistency is revealed by the current study's results and analytical outcomes. This study shows that the factors pivot position ( $h$ ), wedge angle ( $\theta$ ), and Mach number ( $M$ ) have significant effects on the variance of the stiffness derivative. The stiffness derivative rises continuously with the angle of incidence ( $\theta$ ) and reduces continuously as the Mach number ( $M$ ) increases at each pivot location ( $h$ ). The present theory is applicable when the shock waves are attached to the nose of the wedge.

Link: <https://doi.org/10.37934/aram.135.1.180192>





## TITLE:

An Air-Written Real-Time English Isolated Numeral Recognition

## AUTHOR :

Patil C.H.; Jabde M.K.

## JOURNAL NAME:

Communications in Computer and Information Science (Vol.-2430 CCIS)

## DETAILS:

Published on 16 May 2025



## ABSTRACT:

Real-time air-writing numeral datasets are extensively utilized for various applications, including pattern identification of handwritten characters or numerals. The banking industry, reservation counters, online education platforms, operating rooms, and other settings frequently employ air-writing technologies. The English language require more air-written isolated numeric datasets in order to be used for pattern recognition. Thus, for English, the current work presents fresh datasets written in the air. Furthermore, a comprehensive unique technique for air-written real-time English isolated numeral and script categorization recognition is proposed in this paper. We have achieved highest accuracy for English, which is 99.25%.

We collected samples from 100 people in age groups spanning from 20 to 40 for each language in order to construct the dataset. Every person wrote the numbers 0 through 9 ten times in the air for each language, producing 10,000 pictures for English language. The suggested dataset is openly accessible and can be a useful tool for study on pattern recognition.

Link: [https://link.springer.com/chapter/10.1007/978-3-031-88039-1\\_12](https://link.springer.com/chapter/10.1007/978-3-031-88039-1_12)





## TITLE:

Impact of Working Capital on Corporate Performance: Evidence from India; [Влияние оборотного капитала на результаты деятельности компании: данные по Индии]

## AUTHOR :

Muruganandan S.; Rakesh T.S.; Dharani M.

## JOURNAL NAME:

Finance: Theory and Practice (Vol.-29, Issue-2)

## DETAILS:

Published on May 2025



## ABSTRACT:

The subject of this study is to empirically investigate the relationship between working capital and firm performance in India. The purpose of the study is to test the impact of optimal working capital on a firm's market value and profitability. Methodology: The Generalised Method of Movement is employed to study the impact of working capital on a firm's performance, measured as Return on Capital Employed and Enterprise Value to Sales. The results indicate a U-shape relationship between RoCE and the working capital component. On the contrary, the inventory turnover ratio has an inverted U-shape relationship with the market value of the firm. This study concludes that tight inventory management adds value at the initial stage, but strict inventory control erodes market value. The findings of the study support the optimum level of inventories to increase the firm's performance, both in accounting terms and market value.

Link: <https://doi.org/10.26794/2587-5671-2025-29-2-71-82>



### TITLE:

Influence of biopolymers on geotechnical properties and erosion resistance of colliery spoil dumps

### AUTHOR :

Dandin S.; Sathe S.; Ingle G.; Rathod R.

### JOURNAL NAME:

Environmental Science and Pollution Research  
(Vol.-32, Issue-20)

### DETAILS:

Published on 30 April 2025



### ABSTRACT:

Conventional chemical soil binders used on colliery spoil (CS i.e., the material that lies above a coal seam) dumps to mitigate wind and water erosion are facing significant scrutiny due to potential environmental and stability risks. These binders can cause toxicity and leaching, which may harm human health and safety. Using biopolymers would be a new and eco-friendly method that can improve the erosion stability of CS dumps. This article investigates the behaviour of three distinct biopolymers: Agar gum (AG), Guar gum (GG), and Xanthan gum (XG). These biopolymers were used to stabilize CS. The surface charges of these biopolymers vary. XG is anionic, while GG and AG are non-ionic. The study found that biopolymer-treated CS improved in both index and geotechnical properties. This improvement is due to the biopolymers' high viscosity, ability to aggregate, adsorption capabilities, and the formation of cross-linking bonds. The effectiveness of the improvement contrasts on the concentration and type of the biopolymer used. Furthermore, the biopolymer-treated CS were tested for stability against wind and water erosion through various tests, such as pinhole, surface resistance, cylindrical dispersion, and water retention tests. The results showed that even a small amount, 0.5% concentration of biopolymer solution can increase adhesion effects of CS. Moreover, microscopic analysis using a scanning electron microscope (SEM) showed how the structure of the soil changed after being treated with biopolymers. These changes were correlated to improve the geotechnical properties of CS soil. The long chains of biopolymers interacted with the soil to cause these changes. Finally, a leachate analysis was inculcated to measure the effectiveness of untreated and biopolymer-treated CS soil comparatively

Link: <https://doi.org/10.1007/s11356-025-36449-6>



## TITLE:

Critical Review of a Hybrid Annuity Projects  
Model in Public-Private Partnership for Economic  
Development

## AUTHOR :

Sengupta R.; Yadav R.; Patil A.A.; Banerjee S.

## JOURNAL NAME:

Public Private Partnership Dynamics for  
Economic Development

## DETAILS:

Published on April 2025



## ABSTRACT:

The National Highways Authority of India (NHAI) on 24th of November, 2015, notified a new Model Concession Agreements (MCA) titled 'Hybrid Annuity Projects' (HAM) for highway development in India<sup>1</sup>. The MCA addresses issues such as the parties' obligations, allocation of risk, financial support from the Government, force majeure, and termination. With the introduction of this model, the Government is trying to address the challenge faced by traditional Public Private Partnerships (PPP) models in the road sector such as the Build, Operate, Transfer (BOT) and Engineering, Procurement and Construction (EPC) models. Compared to EPC projects, the shift to HAM also eases upfront payment pressure on NHAI, enhances project viability for projects not viable on toll, and reduces NHAI's deferred annuity liability while minimizing pre-emption of future budgetary resources.

Link: <http://dx.doi.org/10.4018/979-8-3693-9153-2.ch003>



## TITLE:

A comprehensive review of object detection with traditional and deep learning methods

## AUTHOR :

Pagire V.; Chavali M.; Kale A.

## JOURNAL NAME:

Signal Processing (Vol.-237)

## DETAILS:

Published on May 2025



## ABSTRACT:

Object detection is one of the most important and challenging tasks of computer vision. It has numerous applications in the fields of agriculture, defence, retail markets and manufacturing units, transportation, social media platforms, medical, wildlife monitoring and conservation. This survey aims to give researchers a comprehensive understanding of the current state of object detection algorithms. In this review, object detection and its different aspects have been covered in detail. This review paper starts with a quick overview of object detection followed by traditional and deep learning models for object detection. The section on deep learning models provides a comprehensive overview of one-stage and two-stage object detectors. A detailed discussion is given of the transformer-based detectors and lightweight networks category. Additionally, the evaluation metrics used for object detection methods are discussed systematically. The best object detection algorithms for different applications are discussed at the end of the survey. This survey is useful for beginners who want to study different object detection algorithms and their use in different applications.

Link: <https://doi.org/10.1016/j.sigpro.2025.110075>





## TITLE:

AI and Political Polarization: Analyzing the Impact of Algorithmic Bias on Governance in Diverse Political Systems

## AUTHOR :

Ghose A.; Pallav P.; Ali S.M.A.

## JOURNAL NAME:

Economic and Political Consequences of AI: Managing Creative Destruction

## DETAILS:

Published on January 2025



## ABSTRACT:

As artificial intelligence increasingly permeates political systems, its influence on governance and democratic processes warrants critical examination. This chapter examines the impact of AI-driven algorithms on governance within diverse and polarized political systems, focusing on the dynamics of algorithmic political bias and its implications for democratic processes. It explores how AI can distort political discourse, amplify biases, and challenge the principles of deliberative democracy and constitutionalism. The chapter also addresses the ethical concerns surrounding AI's role in political campaigns, free speech, and privacy, highlighting the need for algorithmic transparency and accountability. Policy recommendations emphasize the importance of ethical governance frameworks to ensure that AI supports rather than undermines democratic integrity and human rights.

Link: <https://doi.org/10.4018/979-8-3693-7036-0.ch007>



### TITLE:

Implementation of 2D U-Net on the GrapesNet Dataset

### AUTHOR :

Dandekar A.A.; Patalay A.J.; Jadhav P.M.

### JOURNAL NAME:

Smart Innovation, Systems and Technologies  
(Vol.-431)

### DETAILS:

Published on 1 May 2025



### ABSTRACT:

For better results in image segmentation, many annotated images are required. The use of U-net can efficiently make use of the annotated images and create better results. Other models used for segmentation are either computationally expensive or fail to fetch the spatial information. The skip connections in the U-net help resolve these issues. The segmentation and localization are done with high accuracy with feasible computations using the U-net model.

Link: [http://dx.doi.org/10.1007/978-981-96-1210-9\\_6](http://dx.doi.org/10.1007/978-981-96-1210-9_6)



## TITLE:

Acoustics analysis of electric motor in electric vehicle by using finite element analysis

## AUTHOR :

Kothavale B.S.; Didolkar A.A.

## JOURNAL NAME:

Handbook of Vibroacoustics, Noise and Harshness

## DETAILS:

Published on 18 December 2024



## ABSTRACT:

This chapter presents a modal analysis of the electric motor automotive component. Using the finite element approach, the frequency responses for the electric motor's rotor component were calculated. The results of the modal analysis of the electric motor's overall deformation frequency are compared between the stator and rotor parts. The electric motor components are designed using CATIA V5, which also made it simpler to assemble complex pieces. Using ANSA, which turns the domain into a mesh and immediately shows the failure part, the electric motor is refuted. Modal vibrations are calculated using a numerical method. To prevent resonance, rigid body and natural frequencies are computed and shown in various modes. The system is investigated using the ANSYS finite element (FE) code.

Link: [https://link.springer.com/10.1007/978-981-97-8100-3\\_25](https://link.springer.com/10.1007/978-981-97-8100-3_25)



## TITLE:

Novel load balancing mechanism for cloud networks using dilated and attention-based federated learning with Coati Optimization

## AUTHOR :

Kathole A.B.; Singh V.K.; Goyal A.; Kant S.; Savyanavar A.S.; Ubale S.A.; Jain P.; Islam M.T.

## JOURNAL NAME:

Scientific Reports (Vol.-15, I

## DETAILS:

Published 1 May 2025



## ABSTRACT:

Load balancing (LB) is a critical aspect of Cloud Computing (CC), enabling efficient access to virtualized resources over the internet. It ensures optimal resource utilization and smooth system operation by distributing workloads across multiple servers, preventing any server from being overburdened or underutilized. This process enhances system reliability, resource efficiency, and overall performance. As cloud computing expands, effective resource management becomes increasingly important, particularly in distributed environments. This study proposes a novel approach to resource prediction for cloud network load balancing, incorporating federated learning within a blockchain framework for secure and distributed management. The model leverages Dilated and Attention-based 1-Dimensional Convolutional Neural Networks with bidirectional long short-term memory (DA-DBL) to predict resource needs based on factors such as processing time, reaction time, and resource availability. The integration of the Random Opposition Coati Optimization Algorithm (RO-COA) enables flexible and efficient load distribution in response to real-time network changes. The proposed method is evaluated on various metrics, including active servers, makespan, Quality of Service (QoS), resource utilization, and power consumption, outperforming existing approaches. The results demonstrate that the combination of federated learning and the RO-COA-based load balancing method offers a robust solution for enhancing cloud resource management.

Link: <https://doi.org/10.1038/s41598-025-99559-8>



## TITLE:

Global warming modelling simulation based on the numerical weather prediction system

## AUTHOR :

Brahmane J.; Kakade K.S.; Patil A.; Chitranshi J.; Jain A.; Natu P.R.

## JOURNAL NAME:

International Journal of Global Warming (Vol.-36, Issue-2)

## DETAILS:

Published on 14 May 2025



## ABSTRACT:

Accurately and efficiently simulating the climate and predicting the weather are universal goals in the realm of human advancement. Despite its status as the gold standard, numerical weather prediction (NWP) faces challenges due to inherent atmospheric uncertainty and high processing costs, particularly in the post-Moore's Law era. This article summarises the most significant models and noteworthy advances in climate modelling and data-driven weather forecasting. These models reduce prediction times from hours to seconds, outperforming state-of-the-art NWP techniques in over 90% of the variables. Data-driven climate models can accurately reproduce climate patterns across periods ranging from decades to centuries, significantly reducing computational effort and increasing efficiency. However, despite their numerous advantages, data-driven techniques also have notable limitations. These include difficulty in interpreting forecasts, challenges in evaluating model uncertainty, and overly cautious predictions under extreme conditions. The proposed system achieves an accuracy of 96.7%.

Link: <https://doi.org/10.1504/IJGW.2025.146270>



## TITLE:

Comparison and performance of  $\alpha$ ,  $\alpha + \beta$  and  $\beta$  titanium alloys for biomedical applications

## AUTHOR :

Pesode P.; Barve S.

## JOURNAL NAME:

Surface Engineering and Performance of Biomaterials

## DETAILS:

Published on 8 November March 2025



## ABSTRACT:

As implant materials, titanium and its alloys have been extensively utilized because of their exceptional mechanical properties and biocompatibility. Despite this, corporations and researchers alike have kept up their aggressive pursuit of better alloys since there are still issues that require immediate attention. One of these causes a problem with stress shielding as a noticeable variation in the elastic modulus of the implant material. Ti alloys release harmful ions after extended usage. The poor bioactivity of the Ti alloy surface slows the healing process. In order to address these problems, additional research has concentrated on developing Ti alloys for the 21st century that contain a more suitable phase and change the surface of the alloy from inherently bioinert to bioactive. This study assesses the knowledge presently existing on the biological, chemical, mechanical, and electrochemical characteristics of important  $\beta$ -Ti alloys created in recent years with the objective to provide scientific justification for using  $\beta$ -titanium-based alloys as a substitute for cpTi. Dental implants might be made using  $\beta$ -Ti alloys as an alternative. The enhanced alloy qualities, which include a lower modulus of elasticity, improved strength, suitable biocompatibility, and good abrasion and excellent resistance to corrosion, offer the essential proof. Additionally, structural, chemical, and thermomechanical modifications to  $\beta$ -Ti alloys allow for the production of materials that may be tailored to the needs of unique instances for clinical practises. By researching the paper, the performance and attributes of  $\beta$ -titanium alloy are compared to those of other forms of titanium alloy, such as  $\alpha$  titanium alloys. To support their usage as cpTi substitutes, in vivo studies are required to assess new  $\beta$ -titanium alloys.

Link: [https://doi.org/10.1142/9789819812578\\_0009](https://doi.org/10.1142/9789819812578_0009)



## TITLE:

Advantages and Disadvantages of PROTACs

## AUTHOR :

Pujari R.; Bhatt S.; Sharma S.; Soni U.; Patil S.

## JOURNAL NAME:

PROTAC-Mediated Protein Degradation: A  
Paradigm Shift in Cancer Therapeutics

## DETAILS:

Published on September 2024



## ABSTRACT:

The present paper discusses the significant impact of Proteolysis Targeting Chimeras (PROTACs) in targeted protein degradation, presenting a paradigm shift from traditional drug inhibition to protein elimination. PROTACs offer a versatile approach to degrade “undruggable” proteins, expanding the range of potential therapeutic targets. By exploiting the ubiquitin-proteasome system, PROTACs induce the degradation of specific proteins, overcoming limitations associated with protein structure and function. The catalytic degradation function of PROTACs enables efficient and sustained protein elimination, enhancing therapeutic outcomes. Additionally, PROTACs can be combined with other modalities to synergistically target challenging proteins, such as oncogenes and proteins involved in complex interaction networks. While PROTACs hold great promise in improving treatment outcomes, ongoing research and innovation are essential to address challenges like intracellular delivery. Overall, PROTACs represent a groundbreaking approach to drug discovery, offering enhanced selectivity, specificity, and therapeutic potential in various diseases characterized by dysregulated protein expression.

Link: [https://link.springer.com/chapter/10.1007/978-981-97-5077-1\\_4](https://link.springer.com/chapter/10.1007/978-981-97-5077-1_4)



## TITLE:

Enhancing concrete performance with hybrid basalt-polypropylene fibers: experimental and numerical evaluation

## AUTHOR :

Sathe S.; Kolte D.A.

## JOURNAL NAME:

Innovative Infrastructure Solutions (Vol.-10, Issue-5)

## DETAILS:

Published on 30 April 2025



## ABSTRACT:

This investigation assessed the effectiveness of basalt fiber (BF) and polypropylene fibers (PF) in M40 concrete by evaluating its mechanical strength and impact resistance. The concrete was mixed with separate additions of BF and PF and a hybrid combination of both, all in increments of 0.1%. The study found the optimum percentage of BF and PF was 0.2% by weight of concrete under compressive strength (CS), split tensile strength (STS), and flexural strength (FS). Moreover, at optimum percentage, it was found that BF and PF can potentially increase maximum CS by 5.10%, STS by 11.95%, and FS by 4.65% on 28 days of curing. However, including PF and BF in concrete decreases the flowability of the fresh concrete by 7.14% and 17.14%, respectively, at their optimum percentage. Also, experimental observations highlighted that the Modulus of elasticity and impact resistance of BF-added concrete are greater than that of PF-added concrete. Numerical simulations of impact tests with ANSYS software were validated by experimental results that considered the impact times and failure patterns. This study demonstrates that hybrid fiber-reinforced concrete while showing wider cracks, achieves superior impact resistance and more uniform damage distribution compared to plain concrete, which is prone to concentrated tensile failure.

Link: <http://dx.doi.org/10.1007/s41062-025-02019-5>



## TITLE:

Editorial: World No-Tobacco: effects of tobacco and nicotine on the brain

## AUTHOR :

Souza I.N.D.O.; Balerio G.N.; Pandey V.; Grilli M.;  
Neves G.A.

## JOURNAL NAME:

Frontiers in Pharmacology (Vol.-16)

## DETAILS:

Published on May 2025



## ABSTRACT:

Editorial on the Research Topic World No-Tobacco: effects of tobacco and nicotine on the brain Recent evidence places the earliest human tobacco use around 12,300 years ago (Duke et al., 2021). Among plants with psychoactive compounds, tobacco, and by default nicotine, is arguably the most entrenched in human history, affecting several aspects such as health, culture, and social relations (Castaldelli-Maia et al., 2016). Tobacco smoking remains the world's leading preventable cause of death, responsible for approximately 8 million deaths per year (Reitsma et al., 2021). On World No-Tobacco Day, we are advancing our understanding of tobacco and nicotine use and its impact on human health from various perspectives, with the potential to improve public health. Significant gaps remain in our understanding of sex differences in the development of tobacco and nicotine addiction and relapse (Kcomt et al., 2022; Davis et al., 2023). Chellian et al. investigated the operant response to nicotine and the development of addiction in adult rats of both sexes. They also evaluated whether a period of enforced abstinence affected nicotine-seeking behavior. The results showed that nicotine intake was higher in females than in males when they were given prolonged daily access to the drug, highlighting the need for more individualized approaches to tobacco cessation. Indeed, tobacco withdrawal effects are severe enough to halt cessation efforts and require specialized help. With a success rate of around 7% (Méndez et al., 2022), understanding the mechanisms nicotine affects the reward system is fundamental to developing better strategies. Using fMRI, (Conti et al.) showed that midbrain reward-related responses are blunted in a British cohort of habitual smokers. Interestingly, they also found more pronounced abnormalities in short-term young smokers, highlighting the importance of understanding nicotine effects at different points of the life span and its long-term compensatory mechanisms for the development of comprehensive and effective smoking cessation strategies.

Link: <http://dx.doi.org/10.3389/fphar.2025.1610178>



### TITLE:

Alkyd resins from *Argemone mexicana* seed oil: synthesis and characterization for use in anticorrosive coating applications

### AUTHOR :

Das P.; Devi N.

### JOURNAL NAME:

International Journal of Polymer Analysis and Characterization

### DETAILS:

Published on 18 January 2025



### ABSTRACT:

*Argemone mexicana* (AM) seed oil was extracted using petroleum ether as an effective solvent, with a yield of 20.345%. Alkyd resins derived from AM seed oil were synthesized by the alcoholysis-polyesterification method. By measuring the acid value at different times throughout the reaction, the reaction's progress was investigated. The oil and resins underwent additional characterization using techniques such as GPC, <sup>1</sup>H NMR, FT-IR, and GC-MS to determine the molecular weight, structure, and fatty acid composition, respectively. Research was conducted to determine how the presence of maleic anhydride in the resins affected the wettability, anticorrosion, and curing characteristics of the resins and cured films. By mixing alkyd resin with epoxy resin and gradually raising the temperature from 60 °C to 210 °C, the alkyd resins were cured. For several days, alkyd resin-coated mild steel plates demonstrated effective corrosion resistance. The water contact angle (WCA) was measured to assess the wettability of cured films. Higher maleic anhydride content improved performance in paint and surface coatings. Synthetic alkyd resins from AM seed oil showed potential for salt-corrosion resistance, which can be used in marine vessel finishes.

Link: <https://doi.org/10.1080/1023666X.2025.2504559>



## TITLE:

Integrating Automation and Sustainability:  
Arduino-Based Solar Panel Cleaning System for  
Renewable Energy Optimization

## AUTHOR :

Pandey A.; Dubey P.; Rao S.R.; Prasad S.;  
Dhawle K.; Bhagat D.

## JOURNAL NAME:

2025 International Conference on Automation  
and Computation, AUTOCOM 2025

## DETAILS:

Published on 16 April 2025



## ABSTRACT:

This paper realizes the design and implementation of an automatic cleaning system for solar cells through Arduinos, so they can work better and last longer with less maintenance. The system combines an Arduino microcontroller, servo motors, water spray devices, and sensors to automate the cleaning process. This not only eliminates dirt, dust, or debris; it ensures consistent efficacy. Testing showed that output from panels improved significantly after cleaning. Each time only 2.4 liters of water and 0.05 kWh of power were used, for a minimal consumption level. Its modular and inexpensive design makes it suitable for residential and small-scale use. From the optimum interval determined for monthly cleaning, a balance of efficiency gains and cost may be struck. This project forms a practical, not to mention scaleable, and sustainable solution for maintaining solar panels. Use of renewable energy technologies will further reduce the environmental impact. Next-generation developments might incorporate advanced dirt recognition or the convergence of renewable energy integration into their capabilities.

Link:

<https://doi.org/10.1109/AUTOCOM64127.2025.10956276>



## TITLE:

Exploring factors influencing the health-related quality of life of tuberculosis patients: a WHOQOL-BREF-based study

## AUTHOR :

Kodical S.P.; Roy R.; Shetty D.; Up N.; V R.;  
Chand S.; Kolar R.; Jain P.

## JOURNAL NAME:

Monaldi archives for chest disease = Archivio  
Monaldi per le malattie del torace (Vol.-95, Issue-  
1)

## DETAILS:

Published on 30 April 2024



## ABSTRACT:

As a chronic illness, tuberculosis is known to negatively affect patients' day-to-day functioning. Therefore, evaluating all aspects of their health is imperative to improve their quality of life. The current study was conducted to assess the quality of life of patients receiving tuberculosis therapy and to identify the associated risk factors. A prospective, cross-sectional study of 6 months was planned and conducted in 66 *Mycobacterium tuberculosis*-infected patients who met the pre-defined inclusion criteria. All pertinent data about the patients were collected in a precisely created data collection form. Further, the brief version of the World Health Organization Quality of Life Questionnaire was used to evaluate the patient's quality of life. Of the 66 patients who were enrolled, 42 (63.6%) were male, and 14 (21.2%) belonged to the age group of 61-70 years. The domains of physical, psychological, social relationships, and environment had mean scores of  $46.76 \pm 20.15$  standard deviation (SD),  $55.02 \pm 16.12$  SD,  $54.83 \pm 13.91$  SD, and  $64.92 \pm 14.59$  SD, respectively. All four quality-of-life domains were found to have statistically significant associations with a variety of sociodemographic and treatment-related variables. This study gives healthcare practitioners an insight into the need to evaluate patients' health-related quality of life, particularly for individuals with chronic illnesses.

Link: <https://doi.org/10.4081/monaldi.2024.2913>





## TITLE:

Machine Learning-Based Music Recommendation System from Spotify

## AUTHOR :

Bahadure N.B.; Patil P.D.; Kalbande S.;  
Pipalatkar S.; Nagar S.; Kuhikar O.

## JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol,-  
1246, LNNS)

## DETAILS:

Published on May 2025



## ABSTRACT:

Music plays a vital role in our lives. There is a huge amount of information available everywhere; our task is to filter out only the information that is relevant for users in which they are interested or which suits their goals. In this work, we are aiming to build a music recommendation system that will be content-based. A recommendation system is a filtering system that will predict the user's choices in music based on their preferences. The content filtering method relies on the characteristics of data and filters it according to the same. So, we implemented a model that works well for a large number of instances and datasets. The design and implementation of the proposed song recommendation system are highly effective and consistently stable. The encouraging results, with an accuracy of 90.5%, provide a new idea and a theoretical basis and open a new avenue for future research on song recommendation systems.

Link: [http://dx.doi.org/10.1007/978-3-031-88992-9\\_4](http://dx.doi.org/10.1007/978-3-031-88992-9_4)



## TITLE:

Applications of Cellulose Nanocrystals (CNC) in Drug Delivery

## AUTHOR :

Bhutada D.; Shaikh V.; Kabade A.

## JOURNAL NAME:

Specialty Polymers and Materials: Advances, Technologies, Applications, and Future Trends

## DETAILS:

Published on 2025



## ABSTRACT:

It is essential to develop novel and efficient drug delivery systems for the improvement of pharmacological profiles. Various drug delivery systems include carbohydrate polymers. Nanocellulose is a unique and promising natural material extracted from native cellulose. It has gained much attention for its use as a biomedical material, and cellulose nanocrystals (CNC) are one of them. This chapter explores advances in cellulose nanocrystals, a class of nanomaterials with various applications. CNC is produced from materials made from cellulose like wood, cotton, tunicate, and flax fibers that are hydrolyzed with the help of sonochemistry. It has many properties as following which contain high tensile strength, exceptional colloidal stability, stiffness, larger surface area, and the ability to be modified. The present article highlights the fundamentals of cellulose nanocrystals such as sources, preparation, and modification with importance on a multiple drug delivery system. With this chapter, we learn various methods and applications of cellulose nanocrystals in drug delivery.

Link:

<https://www.taylorfrancis.com/chapters/edit/10.1201/9781003561361-14/applications-cellulose-nanocrystals-cnc-drug-delivery-dinesh-bhutada-vasi-shaikh-atharv-kabade>





## TITLE:

From Farms to Tourism: Two Decades of  
Agritourism Trends – A Bibliometric Analysis

## AUTHOR :

Mude G.; Saha S.

## JOURNAL NAME:

Indian Journal of Marketing (Vol.-55, Issue-4)

## DETAILS:

Published on 4 April 2025



## ABSTRACT:

**Purpose :** This study investigated agritourism trends, examining how it diversified rural businesses and contributed to rural economies. It identified the determinants driving agritourism and its various typologies by exploring existing literature. **Design/Methodology/Approach :** A comprehensive bibliometric analysis was conducted using the biblioshiny tool in RStudio, analyzing 1,104 articles from the Web of Science (WoS) database. The study assessed the most cited papers, key contributing authors, and prominent journals. Additionally, a content analysis was performed to uncover emerging themes and research areas in agritourism. **Findings :** The results revealed a growing acceptance of agritourism as a rural economic diversification strategy. The study identified leading authors, institutions, and countries contributing to agritourism research and the evolution of major research themes over time. The analysis underscored the economic, social, and environmental benefits of agritourism while also highlighting the associated challenges. **Practical Implications :** The study provided insights for policymakers, rural developers, and agritourism entrepreneurs in designing effective strategies for sustainable rural development. Understanding agritourism's motivations and challenges aided in formulating supportive policies and development frameworks. However, the study was limited by its reliance on bibliometric analysis, which may not have fully captured qualitative aspects of agritourism practices. Additionally, the exclusion of non-English publications and reliance on WoS data may have resulted in potential bias and omission of relevant studies from other databases. **Originality :** This study adopted a novel approach by integrating bibliometric and content analysis to examine agritourism. By identifying key research trends and themes, it enhanced the theoretical understanding of agritourism and its economic impact.

Link:

<http://dx.doi.org/10.17010/ijom%2F2025%2Fv55%2Fi4%2F174926>



### TITLE:

Intellectual property considerations in the preservation and revival of folklore through tourism: Strategies for sustainable cultural heritage management in India

### AUTHOR :

Ghose A.; Aamir Ali S.M.

### JOURNAL NAME:

Navigating Intellectual Property Challenges in Tourism

### DETAILS:

Published on October 2024



### ABSTRACT:

The commodification of folklore through tourism in India poses unique intellectual property challenges. This chapter explores strategies for sustainable cultural heritage management that respect both the economic and cultural value of these traditions. It contends that while tourism can drive economic growth and foster cultural exchange, it risks misappropriating and decontextualising folklore if not managed with consideration for indigenous intellectual property rights. To address this, the chapter advocates for the development of tailored IPR guidelines to safeguard the interests of local communities that are the custodians of folklore. The chapter proposes a balanced approach that aligns the economic incentives of tourism with the ethical preservation of folklore, ensuring that cultural expressions are not only maintained but also respected and understood, thereby contributing to the sustainable management of India's rich traditions.

Link: <http://dx.doi.org/10.4018/979-8-3693-4171-1.ch003>



## TITLE:

Polysaccharides: Sustainable Green-Composite  
Biomaterials

## AUTHOR :

Shaikh V.A.E.; Shaikh I.V.

## JOURNAL NAME:

Encyclopedia of Green Materials

## DETAILS:

Published on 27 December 2024



## ABSTRACT:

Polysaccharides are natural, long-chain, high molecular weight polymeric carbohydrates composed of monosaccharide and oligosaccharide units, bound together by glycosidic linkages as branched or linear chains. Biocomposites are composite materials in which at least one constituent is derived from a biological origin. Green composites are biocomposites reinforced by natural fibers with biodegradable resins or biopolymers. Sustainability refers to “the development that meets the needs of the present without compromising the ability of the future generations to meet their own needs.”

Link: [http://dx.doi.org/10.1007/978-981-97-4618-7\\_158](http://dx.doi.org/10.1007/978-981-97-4618-7_158)





## TITLE:

Global Regulatory Requirements Applicable for PROTACs

## AUTHOR :

Pujari R.; Soni U.; Gawade A.

## JOURNAL NAME:

PROTAC-Mediated Protein Degradation: A Paradigm Shift in Cancer Therapeutics

## DETAILS:

Published on September 2025



## ABSTRACT:

The present chapter highlights the pivotal role of global regulatory guidelines in overseeing the development, evaluation, and commercialization of PROTACs, a novel class of therapeutic agents with unique mechanisms of action. It emphasizes the importance of adhering to Good Clinical Practice (GCP), Chemistry Manufacturing and Controls (CMC) regulations, and Good Manufacturing Practice (GMP) standards to ensure the quality, safety, and consistency of PROTACs. By following these guidelines, developers can demonstrate the ethical conduct, efficacy, and quality of PROTACs, ultimately supporting their successful regulatory approval and commercialization. The chapter underscores the significance of regulatory compliance in advancing innovative therapeutic approaches for the benefit of patients worldwide.

Link: [http://dx.doi.org/10.1007/978-981-97-5077-1\\_7](http://dx.doi.org/10.1007/978-981-97-5077-1_7)



## TITLE:

A method for IoT devices test case generation  
using language models

## AUTHOR :

Kumar S.; Napte K.; Rani R.; Pippal S.K.

## JOURNAL NAME:

MethodsX (Vol.-14)

## DETAILS:

Published on April 2025



## ABSTRACT:

The rapid growth of IoT and electronic systems has led to complex real-time data processing and management solutions. However, these systems present significant software and hardware testing challenges, often requiring manual, time-consuming testing efforts. To address this, an automated end-to-end testing framework is essential for improving efficiency and reliability in IoT system development. With advancements in Natural Language Processing (NLP) and language models, automated test case generation systems can now create structured test cases in programming languages while ensuring code integrity and style. Applying these techniques to IoT projects streamlines testing, enhances accuracy, and reduces workload. This paper introduces TCG-IoT (Test Case Generation for IoT Systems), an automated testing framework designed to generate comprehensive test cases and actionable event lists based on technical and data specifications. Unlike existing frameworks that depend on model-based testing or simulation environments, TCG-IoT uniquely integrates a Retrieval-Augmented Generation (RAG) mechanism, a vector knowledge base of IoT standards, and code generation via Code-Llama to directly produce structured, executable C-code scripts for software and manual steps for hardware components. The results demonstrate that TCG-IoT delivers high-quality, context-aware test cases and scripts with maximum system coverage, ensuring secure, efficient, and scalable IoT development. •Automates test case generation for IoT hardware and software components. •Enhances test coverage and reliability using language models. •Evaluates performance through case studies on smart home automation.

Link: <https://doi.org/10.1016/j.mex.2025.103340>



## TITLE:

Importance of Synbiotic for the Management of Colorectal Cancers

## AUTHOR :

Kanugo A.; Polshettiwar S.; Gautam R.K.

## JOURNAL NAME:

The Role of Probiotics in Cancer Management  
(Book Chapter)

## DETAILS:

Published on January 2025



## ABSTRACT:

Colorectal cancer (CRC) is the third leading cause of death globally. The enormous rise in the number of CRC cases observed in the last decade is evident in cancer statistics. The lack of nutrients from food, intake of heavy metals and chemicals through vegetables, fruits, and other food items, a sedentary lifestyle, mutations in genes, and DNA damage accelerate the chances of CRC. CRC is also known as bowel cancer, which initiates in the colon and extends to the rectum. CRC is characterized by frequent bowel activities, including diarrhea, constipation, blood in the stool, abdominal cramps and pain, a feeling of incomplete bowel movements, and sometimes weakness or fatigue. Currently, certain well-known biomarkers have been recognized that predict occurrences of CRC, including Micro-RNA, BRAF, KRAS, PI3K, TP53, and stool biomarkers. Moreover, FOBT, FIT, and colonoscopy are the screening techniques for the marked reduction of severe progression of CRC. Synbiotics are comprised of a combination of prebiotics and probiotics that work synergistically to minimize the chances of cancer and other diseases. Synbiotics are responsible for modulating the colonic microbiome, which results in improved metabolic functions. Moreover, the prompt minimization of exposure to tumor-inducing agents and reduced cell proliferation are contributed by synbiotics. Synbiotics show antioxidant and immunomodulatory characteristics, thereby reducing the chances of CRC. The well-balanced composition of human gut microbiota contributes significantly to the minimization of chances of CRC. Moreover, the generation of SCFA, the neutralizing capability of several enzymes responsible for inducing tumors, and the suppression of inflammation as well as pathogen activity also help prevent CRC.

.Link:

<https://www.taylorfrancis.com/chapters/edit/10.1201/9781003610748-7/importance-synbiotic-management-colorectal-cancers-abhishek-kanugo-satish-polshettiwar-rupesh-gautam>





## TITLE:

A Hybrid Smartphone Recommendation Model  
Using Different Machine Learning Algorithms

## AUTHOR :

Chandak K.; Bokhare A.; Pillai S.; Pabalkar V.

## JOURNAL NAME:

International Journal of Computing and Digital  
Systems (Vol.-18, Issue-1)

## DETAILS:

Published on April 2025



## ABSTRACT:

In today's world, mobile phones are an essential part of many people's daily lives. With several smartphones to choose from, people are often confused about which smartphone will be best for their use. This study aims to present an accurate and usable prediction model for real-life mobile phone reviews by individual users to improve the prediction accuracy of the model. A review-based prediction model is built on the behavior and choice of individual users using machine learning. This data has been collected using web scraping tools like UiPath and the Python Beautiful Soup library from different websites, followed by data preprocessing. In this study, different Collaborative Filtering-based machine learning algorithms have been used and compared. The algorithms used include KNN based on individual items or individual users and an unsupervised SVD-based model. This has been demonstrated using UiPath Studio and the Druid AI chatbot. The Druid chatbot provides smartphone recommendations and data based on user input. Upon entering a smartphone name, a UiPath process is triggered, sending the results back to the chatbot. This UiPath-based chatbot provides specifications and recommendations. Future enhancements include broader product recommendations, improved user understanding through advanced NLP training, and a better user experience overall. Additionally, there will be a focus on incorporating user feedback to continuously refine and enhance the prediction model, ensuring it remains relevant and highly accurate.

Link: <https://www.scopus.com/record/display.uri?eid=2-s2.0-105004777403&origin=resultslist&sort=plf-f&src=s&sot=b&sdt=b&s=TITLE-ABS-KEY%28A+Hybrid+Smartphone+Recommendation+Model+Using+Different+Machine+Learning+Algorithms%29>



## TITLE:

An efficient fault diagnosis model using Lappet Falco optimisation based on a deep neural network for the VSI under varying load conditions

## AUTHOR :

Baste V.; Shende D.; Idhate S.; Deshpande A.

## JOURNAL NAME:

International Journal of Power Electronics (Vol.- 21, Issue-3)

## DETAILS:

Published on 30 April 2025



## ABSTRACT:

Numerous industrial applications employ three-phase converters that are based on insulated-gate bipolar transistors (IGBTs). However, the functioning and safety of power electronic devices and loads can be considerably impacted by IGBT faults. Maintaining high-power quality and system availability requires timely and accurate detection of power inverter failures. Constantly monitoring the failures in three-phase voltage source inverter (VSI) has greatly improved maintenance efficiency and stability. Hence, the developed research employs the discrete wavelet transform (DWT) and Lappet Falco optimised deep neural network (LFO-DNN) model to create an open circuit fault detection model for the VSI circuit. Data collection involves extracting features such as three-phase voltage, current, speed, and torque from erroneous data. The DNN classifier trained on these features uses the average three-phase current value to identify faulty switches. The VSI acting as a load with variable frequency reference is connected to a three-phase induction motor. The proposed Lappet Falco optimisation accurately yields impressive results in terms of prediction accuracy of 96.34%, precision of 96.34%, recall of 96.24%, F1 measure of 94.23%, MSE of 3.66, and specificity of 95.28%, demonstrating high efficiency for both 90% training and a k-fold value of 10.

Link: <https://doi.org/10.1504/IJPELEC.2025.145951>





## TITLE:

Specialty Polymers And Materials: Advances, Technologies, Applications, And Future Trends

## AUTHOR :

Kulkarni S.; Shaikh V.

## JOURNAL NAME:

Specialty Polymers and Materials: Advances, Technologies, Applications, and Future Trends  
(Book Edited)

## DETAILS:

Published on 20 March 2025



## ABSTRACT:

Specialty polymers are noted for their ability to retain valuable mechanical, thermal, and chemical characteristics when subjected to harsh environments, such as high temperature, high pressure, and corrosive chemicals. This new volume focuses on specialty polymers and polymer-based materials in novel application areas, discussing the synthesis and preparation methods, the derived materials from them, and how they are applied. The volume touches on applications that vary from biomedical and defense to high-performance coatings and smart materials for catalytic, agricultural, environmental, and packaging applications. Chapters explore the characteristic and distinct properties of specialty polymers, such as biodegradability, high performance, smart behaviors, and other distinct characteristics. The book explores diverse applications in oil fields, focusing on carbon geo-storage; for agricultural uses of various polymeric nanocomposites; for smart polymeric coatings and adhesives, including edible polymers and their applications in the food packaging industry; and in biosensor design. The volume also looks at smart polymers and composites for drug delivery systems. Specialty Polymers and Materials: Advances, Technologies, Applications, and Future Trends provides new information that will be of value to researchers working with polymers and materials in many areas.

Link: <https://doi.org/10.1201/9781003561361>



### TITLE:

Sustainability of electricity production using a mathematical model for optimal strategic planning: application on Egyptian electricity holding company (case study)

### AUTHOR :

Khalifa H.A.E.-W.; Akilbasha A.; Abd Elazeem A.E.M.; Shankar U.; Meenakshi K.; Johnston S.J.

### JOURNAL NAME:

Discover Applied Sciences (Vol.-7, Issue-5)

### DETAILS:

Published on 28 April 2025



### ABSTRACT:

The optimization of the product mix for electricity generation is an important undertaking, with cost efficiency and emission reduction as the primary aims. In this paper, a linear programming model was proposed to support a strategic plan for the electricity production sector. The model aims to get the optimal product mix that minimizes the cost and restricts emissions and fuel consumption. Hypothetical dimensions of the problem were illustrated and the formulation of the model was presented. For the efficiency test, the model was applied to Cairo Company for electricity production which is one of the companies of the Egyptian Electricity Holding Company. The results of applying the proposed model show that the cost improved (reduced) by 10% with an increase of 14.34% in the emissions (still within the permitted limit). The applicability and efficiency were proven by applying the model and analyzing the results.

Link: <http://dx.doi.org/10.1007/s42452-025-06531-2>



## TITLE:

ZK-STARK: Mathematical Foundations and Applications in Blockchain Supply Chain Privacy

## AUTHOR :

Arade M.S.; Pise N.N.

## JOURNAL NAME:

Cybernetics and Information Technologies (Vol.-25, Issue-1)

## DETAILS:

Published on March 2025



## ABSTRACT:

Privacy is one of the major security concerns. The zero-knowledge proof enables the transmission of data from the sender to the receiver without disclosing the actual content of the data. The proposed work uses the ZK-STARK (Zero-Knowledge Scalable Transparent ARgument of Knowledge) Algorithm for transaction privacy in the organic jaggery supply chain. The paper emphasizes a detailed mathematical model, involving two key participants: the prover (food processor) and the verifier (distributor). The prover calculates the polynomial for the problem, its composition polynomial, and provides its Merkle proof to the verifier. The verifier conducts queries to confirm and validate the accuracy of the information. Using the fast reed-solomon interactive oracle proofs protocol, the proof is validated. It measures performance as proof generation and verification time, proof size, and throughput. Plans involve increasing the domain size of this algorithm, varying the polynomial interpolation, and evaluating its performance measures by integrating it into Blockchain.

Link: <https://doi.org/10.2478/cait-2025-0001>



## TITLE:

Exploring the Gut-Brain Axis: Microbiome Contributions to Pathophysiology of Attention Deficit Hyperactivity Disorder and Potential Therapeutic Strategies

## AUTHOR :

Phatak M.; Nair B.; Soni U.; Pujari R.

## JOURNAL NAME:

Current Drug Metabolism

## DETAILS:

Published on 8 April 2025



## ABSTRACT:

Attention Deficit Hyperactivity Disorder (ADHD) is a prevalent neurodevelopmental disorder characterized by symptoms of hyperactivity, inattention, and impulsivity, significantly impacting individuals' daily functioning and quality of life. This manuscript explores the intricate relationship between the gut microbiome and ADHD, emphasizing the role of the gut-brain axis, a bidirectional communication pathway linking the central nervous system (CNS) and the gastrointestinal tract (GIT). The composition of gut microbiota influences several physiological processes, including immune function, metabolism, and the production of neuroactive metabolites, which are critical for cognitive functions such as memory and decision-making. The review discusses alternative therapeutic options, including dietary modifications, synbiotics, and specific diets like the ketogenic diet, which may offer promising outcomes in managing ADHD symptoms. Further research is necessary to establish the efficacy and mechanisms of action of synbiotics and dietary interventions, despite preliminary studies suggesting their potential benefits. This review article aims to provide a comprehensive overview of the current understanding of the gut microbiome's impact on ADHD, highlighting the need for continued investigation into innovative treatment strategies that leverage the gut-brain connection.

Link:

<https://doi.org/10.2174/0113892002361676250325082424>



## TITLE:

Legal personality in the metaverse: A  
jurisprudential examination

## AUTHOR :

Sanjaya K.; Chandra R.; Panikkassery A.S.;  
Sanjaya K.; Srivastava S.

## JOURNAL NAME:

Unveiling Social Dynamics and Community  
Interaction in the Metaverse

## DETAILS:

Published on February 2025



## ABSTRACT:

One of the novel legal issues we see developing in the metaverse is whether or not avatars and AI agents should be given standing as legal people? This chapter advances a jurisprudence that discusses the rights, responsibilities and autonomy of digital entities in virtual spaces and assesses elements of jurisprudence, such as corporate personhood, which may be relevant in the absence of physical presence. Through examples of both popular, widely known platforms sites like Second Life and Decentraland as well as recent blows to idealism around digital legal spheres through experimental governance projects like Estonia's e-Residency program, the chapter addresses some current junctures to discuss challenges about issues such as accountability, jurisdiction, and intellectual property. It draws attention to the necessity of creative legal mechanisms and global norms for regulating new digital frontiers, propelling the conversation on how we apply our jurisprudence to digital environments forward.

Link: <http://dx.doi.org/10.4018/979-8-3693-8628-6.ch009>





## TITLE:

Exploring The Influence Of Organisational Culture Dimensions On Employee Performance In It Organisations

## AUTHOR :

Tripathi M.A.; Shelake V.; Lenka R.; Musale V.

## JOURNAL NAME:

International Journal of Innovation Management

## DETAILS:

Published on April 2025



## ABSTRACT:

This study examines the diverse dimensions of Organisational Culture and their influence on employee performance. Conducting an extensive literature review on cultural dimensions, we designed a structured questionnaire encompassing aspects of both Organisational Culture and Employee Performance. This questionnaire was distributed among a targeted sample, selected using a simple random sampling method. Out of the 424 questionnaires distributed to employees across various IT organisations, 404 valid responses were obtained after removing invalid ones. The analysis revealed a significant correlation between the study dimensions and employee performance. Our outcomes suggest a need for organisations to prioritise fostering Risk-Taking behaviour and maintaining a flexible Organisational Structure, integrating these dimensions into their culture to enhance employee performance, consequently contributing to overall organisational success.

Link: <https://doi.org/10.1142/S1363919625500161>





## TITLE:

Deep Learning Approaches for Evaluating the Quality of Fruits and Vegetables

## AUTHOR :

Divtelwar G.; Bondade A.; Patil S.; Bhagat D.;  
Suri C.

## JOURNAL NAME:

2024 IEEE 2nd International Conference on  
Emerging Trends in Engineering and Medical  
Sciences, ICETEMS 2024

## DETAILS:

Published on 22 April 2025



## ABSTRACT:

The Fresh Fruit Identification System constitutes a notable advancement in the meals industry. Employing sophisticated technologies along with machine-getting-to-know and computer imagination and prescient, it complements the great evaluation and optimization of perishable items, mainly focusing on culmination and greens. This contemporary system employs advanced gadgets gaining knowledge of models, especially convolutional neural networks (CNNs), to meticulously analyze high-decision pics of processed meals. By rapidly and appropriately identifying objects based totally on attributes that include shade, texture, and shape, the machine guarantees no longer the simplest precision in categorization but also an in-intensity best evaluation. This entails defect detection and ripeness assessment, ensuring that the most effective rate-satisfactory merchandise reaches customers. Implementing sturdy and scalable systems has addressed demanding situations associated with facts, model education, and real-time processing. Consequently, the Fresh Food Identification System emerges as a pivotal contributor to raising the standards of the perishable meals supply chain, embodying a dedication to excellence and performance.

Link:

<https://doi.org/10.1109/ICETEMS64039.2024.10964979>



## TITLE:

Losing the carbon game? Changing face of a tropical smart metro city and its repercussions on carbon sequestration, heat and flood mitigation capacity

## AUTHOR :

Chalke P.; Koparde P.

## JOURNAL NAME:

Sustainable Futures (Vol.9)

## DETAILS:

Published on April 2025



## ABSTRACT:

Tropical areas are rich in biodiversity but adversely getting affected by non-sustainable rapid development and climate change. Pune city is a tropical smart metro city of India, located on the edges of the Western Ghats biodiversity hotspot. The city is surrounded by hills and is lined by four rivers. The city is a cultural, heritage, educational, and IT hub and is expanding rapidly. In the context of rampant urbanization and intensification in tropical metro cities, the present study utilizes GIS and RS tools to investigate the dynamic transformation of Pune city's landscape from 2013 to 2022. Here we analyze four indices for Pune city, namely, carbon sequestration capacity, flood and heat mitigation capacity, and vegetation dynamics over a decade. The paper explores consequential shifts in land use and land cover, employing advanced modeling techniques, specifically the InVEST software. We report a rapid rise in built-up area by 12 % at the loss of scrubland (16 %) when compared data from 2013 to 2022. The years 2020–2022 showed a spike in NDVI values and lowering of Land Surface Temperature, correlated with less human activity owing to the city-wide lockdown during COVID-19 pandemic. Our analysis revealed that the city has lost its carbon sequestration capacity by 34 % and flood mitigation capacity by 13 % when compared data from 2013 to 2022. Hills of Pune exhibit a higher heat mitigation compared to the rest of the area. Our results highlight the importance of native geological features such as hills in carbon sequestration, heat and flood mitigation. Our research implies that sustainable development in tropical metro cities can be achieved by leveraging native features rather than undermining them.

Link: <https://doi.org/10.1016/j.sfr.2025.100634>





## TITLE:

Evolving Artificial Intelligence and Blockchain Technology in Accounting and Auditing

## AUTHOR :

Doifode A.; Bhosale T.; Pillai D.; Singh A.S.

## JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.-1302)

## DETAILS:

Published on May 2025



## ABSTRACT:

This paper studies the outgrowth of artificial intelligence and blockchain technology in modern-day accounting and auditing practices. The abilities of cognitive technologies are in focus in recent studies, as well as their impact on the audit process and the auditors. The scope and useful features of Blockchain, its business models, the procedures involved, its associations with other technologies, and its connections to accounting theories are all examined in this paper. The results are consistent with one of the most intriguing theories, which holds that technology, acting as an external force, has the power to unite several academic disciplines, such as management, accounting, auditing, computer science, business, and engineering. Although the linkages with accountability need to be established and supported, Blockchain clearly impacts accounting auditing in previous studies.

Link: [http://dx.doi.org/10.1007/978-981-96-3381-4\\_25](http://dx.doi.org/10.1007/978-981-96-3381-4_25)



## TITLE:

Poloxamer: Application as Promising Polymer in Different Drug Delivery Systems

## AUTHOR :

Chabukswar A.R.; Waghmare P.S.; Jagdale S.C.

## JOURNAL NAME:

Specialty Polymers and Materials: Advances, Technologies, Applications, and Future Trends (Book Chapter)

## DETAILS:

Published on January 2025



## ABSTRACT:

Poloxamers are also known as Pluronic. These are amphiphilic block copolymers of poly (ethylene oxide) (PEO) and poly (propylene oxide) (PPO) that provide advantageous association and adsorption capabilities in pharmaceutical formulations. Due to the diverse physicochemical properties of poloxamers like increasing drug solubility, biocompatibility, biodegradability, high efficiency for drug loading, lowering drug toxicity, adjusting drug release rate, and defense against biochemical degradation, poloxamers find use in drug delivery and tissue engineering. A self-assembled structure of poloxamer has been extensively studied in the development of new drug carriers like various nanoformulations. The thermogelling delivery technique of poloxamers is capable of protecting labile molecules, like proteins and peptide drugs, and solubilizing drugs that are weakly soluble or water insoluble for medicinal and diagnostic purposes. Poloxamers will undoubtedly be used in the future generation of pharmaceutical products, and a number of formulation issues will be resolved. In this chapter, we have described the overall solution behavior of poloxamers, emphasizing their self-assembly capabilities. Various processing methods that can be used to encapsulate medicines are discussed. This book chapter provides a more comprehensive understanding to aid in the development of poloxamer-based formulations. Various aspects of poloxamer for physicochemical modification and pharmacological response modification have also been described. Recent advances and nano formulations of poloxamer have been reported with the future potential of poloxamers in different drug delivery systems.

Link: <http://dx.doi.org/10.1201/9781003561361-11>



## TITLE:

Laplacian biogeography-based algorithm using a gaining–sharing knowledge-based strategy for global optimization problems and the Lennard-Jones problem

## AUTHOR :

Garg V.; Deep K.; Kulkarni A.J.

## JOURNAL NAME:

Engineering Optimization

## DETAILS:

Published 21 May 2025



## ABSTRACT:

Hybridizing nature-inspired algorithms helps to overcome the limitations of the individual algorithms. These methods are good at either exploration or exploitation. The balance between these two is a crucial factor in designing a robust and efficient algorithm. In this article, two such algorithms, the Laplacian biogeography-based optimization (LX-BBO) and gaining–sharing knowledge-based (GSK) algorithms, are hybridized to create an algorithm balancing exploitation and exploration, named LX-GSBBO. The proposed algorithm is tested and compared with its counterparts on IEEE CEC 2014 benchmark functions, structural engineering problems and one complex real-world problem, i.e. the Lennard-Jones potential problem. The statistical tests and convergence graphs confirm the superiority of the proposed algorithm.

Link: <https://doi.org/10.1080/0305215X.2025.2496941>





## TITLE:

Comparative Analysis of Residential Property Rates and Rents for West Pune City Pre and Post COVID

## AUTHOR :

Ahir S.R.; Pimplikar S.

## JOURNAL NAME:

AIP Conference Proceedings (Vol.-3305, Issue-1)

## DETAILS:

Published on May 2025



## ABSTRACT:

The COVID-19 pandemic significantly impacted the real estate sector, particularly in Pune, India. This study investigates the correlation between residential property market prices and rental income in Pune's West Zone before and after the pandemic. Data on property sale/purchase rates and rents were collected from the official government website for the years 2018-2023 in five localities: Wakad, Baner, Sus, Bavdhan, and Warje. Descriptive statistics, line charts, and correlation analysis were used to analyze the data. Property purchase rates showed an upward trend across all localities over the six years, with the steepest increases in Wakad and Baner. Rental rates also increased, but to a lesser extent, with the most significant rise observed in Bavdhan. The ROI also had a spike during the COVID, with most significant rise observed in Wakad and Sus. The coefficient of correlation analysis revealed a strong positive correlation between property rates and rents in all five localities, with Wakad exhibiting the strongest correlation. While COVID-19 impacted the market, a positive correlation persisted between property rents and property rates, indicating that higher rents are associated with higher property prices. This study suggests a positive correlation between rent, property rates, and interest rates in Pune's West Zone. The findings can inform real estate investment decisions by highlighting the relationship between income generation potential and property value.

Link: <https://doi.org/10.1063/5.0272314>





## TITLE:

Empowered ownership: The impact of employee ownership on environmental and social sustainability

## AUTHOR :

Paigude S.D.; Pangarkar S.; Srivastava S.P.

## JOURNAL NAME:

Organizational Models, Cultural Dynamics, and CSR Applications in Employee-Owned Enterprises

## DETAILS:

Published on 2025



## ABSTRACT:

Employee ownership can be seen as a tool to build and utilize the power to employee strengthen & power, expand wealth. This model will also deepen employee engagement and bring in more value to business. Previous studies have not established a similar stance on the favourable impact of employee ownership on environmental and social sustainability. Moreover, researchers contend that sustainability is a multifaceted notion for organisations, considering an organisational ownership structure, it may be argued that the impact of ownership might vary across different dimensions of sustainability. Ownership can exhibit both responsible and irresponsible behaviour in relation to organisational corporate social responsibility (CSR) at the micro level and sustainability at the macro level simultaneously. This book chapter proposal aims to address these research concerns through comprehensive analysis in order to ascertain the impact of employee ownership on environmental and social sustainability.

Link: <https://www.igi-global.com/chapter/empowered-ownership/373187>



## TITLE:

Exploring the Quality and Safety Aspects of  
LGSF-Ferron Modular Construction in Indian  
Context

## AUTHOR :

Minde P.; Kulkarni M.; Burde D.

## JOURNAL NAME:

Journal of Mines, Metals and Fuels (Vol.73,  
Issue-2)

## DETAILS:

Published on February 2025



## ABSTRACT:

The Indian construction industry is grappling with an affordable housing crisis, prompting the exploration of alternative construction methods. Traditional techniques, such as brick and concrete, are increasingly labour-intensive and costly. This paper investigates the potential of Light Gauge Steel Frame (LGSF) construction, particularly when combined with Ferron, a composite material that enhances structural integrity while reducing costs and construction time. The LGSF-Ferron system eliminates the need for formwork and offers benefits like increased fracture resistance and sustainability, positioning it as a viable alternative to reinforced concrete. Despite its advantages, the adoption of LGSF-Ferron in India remains in its early stages, with critical quality and safety challenges that must be addressed. High-quality assurance and safety management standards are essential to mitigate risks such as financial losses and injuries during on-site construction. This study emphasises the importance of stringent quality control measures, including material quality checks, precision manufacturing, structural engineering compliance, and ongoing quality assurance throughout construction. Through a comprehensive analysis of the benefits, challenges and solutions associated with LGSF-Ferron modular construction, this research aims to provide insights into its role in promoting sustainable and affordable housing in India. Key findings highlight the necessity for pre-engineered components, rigorous on-site inspections and adherence to regulatory standards to ensure successful implementation. By addressing quality and safety concerns, LGSF-Ferron technology can significantly contribute to more efficient building practices and help alleviate the ongoing housing crisis in India. The paper's findings show that LGSF-Ferron is a sustainable, cost-effective alternative, requiring better quality control, safety, and workforce training for adoption in India. Major Findings: The study identifies LGSF-Ferron modular construction as a sustainable, cost-effective solution to India's housing crisis, emphasizing the need for rigorous quality control, safety standards, and skilled workforce training for effective adoption.

Link: <https://doi.org/10.18311/jmmf/2025/47416>



## TITLE:

Ergonomic design of shoe inserts for reducing lower extremity musculoskeletal discomfort in male Participants: An analysis of shape and size

## AUTHOR :

Ahmad W.; Alam M.S.

## JOURNAL NAME:

International Journal of Industrial Ergonomics  
(Vol.-107)

## DETAILS:

Published on May 2025



## ABSTRACT:

**Background:**The human foot endures substantial forces during daily activities such as walking and standing, often bearing loads 1.5 to 5 times the individual's body weight. These forces propagate through the lower extremity musculoskeletal structures, placing stress on critical joints, which can lead to discomfort, musculoskeletal issues, and reduced productivity. Shoe inserts (SIs) have emerged as effective ergonomic interventions, provided additional support and redistributed pressure to alleviate discomfort and enhance gait stability.**Objective:**This study investigates the ergonomic effects of shoe insert placement, shape, and surface area on perceived comfort and plantar pressure distribution during static standing.**Methods:**Twenty-six healthy male participants were assessed using flat and contoured inserts of varying surface areas ( $30 \times 30 \text{ mm}^2$ ,  $40 \times 40 \text{ mm}^2$ , and  $50 \times 50 \text{ mm}^2$ ). Comfort ratings were measured using a Visual Analogue Scale (VAS), while plantar pressures (peak and mean) were evaluated using F-Scan sensors. Data were analysed using paired t-tests and repeated-measures ANOVA, with Bonferroni corrections applied for multiple comparisons.**Results:**Inserts placed 2–4 cm anterior to the lateral midfoot region provided the highest comfort ratings. Contoured inserts consistently outperformed flat designs in improving comfort and reducing plantar pressures across all surface areas ( $p < 0.017$ ). Larger surface area inserts ( $50 \times 50 \text{ mm}^2$ ) were the most effective in enhancing subjective and objective outcomes, demonstrating significant improvements compared to smaller designs ( $p < 0.001$ ).**Conclusion:**This study underscores the importance of precise placement, contoured designs, and larger surface areas in optimizing the ergonomic benefits of shoe inserts. These findings have practical implications for the design of ergonomic footwear and orthotics, particularly for individuals in occupations requiring prolonged standing.

Link: <https://doi.org/10.1016/j.ergon.2025.103754>



## TITLE:

Gamification in employee training and development on enhancing learning outcomes and engagement

## AUTHOR :

Supritha K.S.; Prabha A.; Sherine S.B.;  
Kolachina S.; Gaurav K.; Ishwarya M.

## JOURNAL NAME:

Multidisciplinary Approaches to AI, Data, and  
Innovation for a Smarter World (Book Chapter)

## DETAILS:

Published on February 2025



## ABSTRACT:

Gamification fosters employee training and knowledge retention in various ways. The incorporation of game mechanics, such as point scoring, leaderboards, and challenges within traditional programs, is what makes gamification a win-win situation! With this method, you create a way of engagement and motivation through fun that makes learning a pleasure. Gamification has a competitive and interactive edge that drives employees to focus on knowledge retention but also simplifies arduous tasks into bite-sized activities. Research reveals that providing game dynamics results in an improved understanding of the material and better transferability of skills due to instantaneous feedback, progress tracking, and areas for improvement. Moreover, the use of gamification enhances collaborative work and social bonding within an organization. Moreover, it encourages the acquisition of different competencies that are very important in this day and age since the business environment is quite dynamic, including problem-solving and adaptability.

Link: <http://dx.doi.org/10.4018/979-8-3693-9375-8.ch007>



## TITLE:

Consumer Usage Intention Factors for Mobile Food- Delivery Applications Using Task Technology Fit Approach

## AUTHOR :

Shirolkar S.; Patil K.

## JOURNAL NAME:

Communications in Computer and Information Science (Vol.-2429 CCIS)

## DETAILS:

Published on 22 April 2025



## ABSTRACT:

Consumer decision-making for continuous usage of food delivery apps amid cut-throat competition requires rigorous, disciplined marketing strategies and evaluation. The catalyzing restaurants use online food ordering apps as an alternative channel to reach consumers for delivering the order. This research seeks to verify the dimensions of consumer usage that impact consumer satisfaction and their inclination to continue using online food delivery aggregator applications. Survey questionnaire data from 531 users were collected and spread across the age groups for the analysis and model testing. The results showed a significant impact of Application functionality, Task characteristics, and Task technology fit on consumer satisfaction and continuance intention. The results showed an insignificant association between “perceived ease of use”, “perceived usefulness”, and “consumer satisfaction”. Task Technology Fit significantly affects perceived ease of use, perceived usefulness, and consumer satisfaction. This research study will help practitioners to accord with the competition in the food delivery mobile application sector. The current research also discussed the implications of the findings theoretically and practically with future research agendas.

Link: [https://doi.org/10.1007/978-3-031-86305-9\\_17](https://doi.org/10.1007/978-3-031-86305-9_17)



## TITLE:

Exploring the Albumin Nanoparticles as the Next-Generation Advanced Multifunctional Biomaterials for Inhalation Lung Therapy: Facts, Prospects, and Challenges

## AUTHOR :

Kumbhar S.; Bobade C.; Velapure P.; Pawade D.; Bothiraja C.; Shinde V.; Mali A.

## JOURNAL NAME:

Biomedical Materials and Devices

## DETAILS:

Published on May 2025



## ABSTRACT:

Albumin nanoparticles (AlbuNanos) are highly promising approach for delivering drugs directly to the lungs, effectively addressing medical demands that have not yet been satisfied. AlbuNanos are gaining significant interest in the scientific community due to their distinct structural traits, physiological aspects, and biological functions. This paper seeks to offer a thorough examination of the utilization of AlbuNanos in inhalation drug administration, with a specific emphasis on their composition, physical and chemical characteristics, therapeutic uses, and potential future developments. This study commences by providing contextual information on AlbuNanos, encompassing its diverse classifications, with a specific focus on the formulation and process characteristics. The study subsequently examines the therapeutic uses of AlbuNanos and their conjugates, bolstered by data from pharmacokinetic and pharmacodynamic investigations. In addition, the study provides information on the current progress of clinical trials and patents concerning AlbuNanos. The investigation demonstrates that AlbuNanos provide distinct benefits in delivering drugs to the lungs, such as improved drug targeting and prolonged release patterns. Furthermore, the paper examines the present advancements in clinical trials and patents, showcasing the increasing fascination in this pioneering delivery technology. This article presents a comprehensive compilation of information and viewpoints on the various uses of AlbuNanos in delivering drugs to the lungs.

Link: <http://dx.doi.org/10.1007/s44174-025-00358-6>



## TITLE:

Non-linear magnetic buoyancy instability and galactic dynamos

## AUTHOR :

Qazi Y.; Shukurov A.; Tharakkal D.; Gent F.A.;  
Bendre A.B.

## JOURNAL NAME:

Monthly Notices of the Royal Astronomical  
Society (Vol.-540, Issue-1)

## DETAILS:

Published on 14 May 2025



## ABSTRACT:

Magnetic buoyancy (MBI) and Parker instabilities are strong, generic instabilities expected to occur in most astrophysical systems with sufficiently strong magnetic fields. In galactic and accretion discs, large-scale magnetic fields are thought to arise from mean-field dynamo action, particularly the

-dynamo. Using non-ideal MHD equations, we model a section of the galactic disc where the large-scale magnetic field is generated by an imposed

-effect and differential rotation. We extend our previous study of the interplay between magnetic buoyancy and the mean-field dynamo by incorporating differential rotation, which enhances the dynamo, and cosmic rays, which amplify magnetic buoyancy. We construct a simple one-dimensional (1D) model which replicates all significant features of the three-dimensional (3D) simulations. Simulations confirm that magnetic buoyancy can lead to oscillatory magnetic fields and reveal that it can change the magnetic field parity between quadrupolar and dipolar states. Differential rotation facilitates this switch in parity, suggesting that the large-scale magnetic field can adopt a dipolar parity within a few kiloparsecs of the galactic centre. In contrast, quadrupolar parity may remain predominant in the outer parts of a galactic disc. Cosmic rays accelerate both the dynamo and the MBI, supporting oscillatory non-linear states and a spatial magnetic field structure similar to the alternating magnetic field directions observed in the haloes of some edge-on galaxies.

Link: <https://doi.org/10.1093/mnras/staf766>



## TITLE:

Freezing of USAID: a health crisis for India's transgender community

## AUTHOR :

Banerjee S.S.; Goswami Banerjee B.

## JOURNAL NAME:

The Lancet (Vol.-405, Issue-10492)

## DETAILS:

Published on 24 May 2025



## ABSTRACT:

On Jan 20, 2025, US President Donald Trump enacted an executive order imposing a 90-day suspension of foreign development aid. The order was followed by a stop-work directive that paused most US aid-supported projects worldwide, with only a few exceptions.<sup>1</sup> The pausing of US Agency for International Development (USAID) funds has affected dozens of development programmes around the world, especially in low-income countries. The impact of this policy shift has been profound and has disrupted crucial health-care services for one of India's most vulnerable populations, transgender people.<sup>2</sup> A substantial effect of the fund freeze was the shutting down of Mitr clinics for transgender people in India. Mitr clinics had a crucial presence in the health-care sector in India, as they served approximately 6000 people since 2021. With a monthly grant of 250 000 rupees (approximately US\$2900 or £2300) from USAID, these clinics were run by doctors, counsellors, and health workers who were also from the transgender community.<sup>2</sup> According to the 2011 census, approximately 4.87 million people officially belonging to the third gender live in India, and of these people, 2 million identify as being transgender.<sup>3</sup> Although people recognised as the third gender have the same rights as people of other genders in India under a 2014 Supreme Court ruling, many are still struggling to access education and health care.<sup>3</sup> The Mitr clinics were more than just medical centres; they served as lifelines offering free HIV prevention services, hormone therapy guidance, mental health support, and legal aid. As the clinics provided privacy and confidentiality, transgender individuals felt encouraged to have HIV tests and seek care. With the unforeseen closure of the Mitr clinics, India's transgender community's access to medical support, including for crucial HIV prevention and treatment, is in peril.<sup>4</sup> The shutting down of the Mitr clinics is a severe blow to the transgender community and has uncertain consequences. The situation calls for immediate action from both national and international governmental and non-governmental agencies to ensure the existence of health-care facilities for the transgender community. Although initiatives such as the Transgender Persons (Protection of Rights) Act, 2019 have been steps in the right direction,<sup>5</sup> much more needs to be done, including government agencies incorporating transgender health services into national and state health-care programmes such as Ayushman Bharat.

Link: [https://doi.org/10.1016/S0140-6736\(25\)00908-0](https://doi.org/10.1016/S0140-6736(25)00908-0)



## TITLE:

Understanding Consumer Sentiments Towards Two-Wheeler Electric Vehicles: Implications for Organizational Sustainability and Corporate Social Responsibility

## AUTHOR :

Deshmukh S.; Sharma A.

## JOURNAL NAME:

Sustainable Civil Infrastructures

## DETAILS:

Published on 16 May 2025



## ABSTRACT:

Electric vehicles (EVs) are essential to reducing greenhouse gas emissions and combating climate change. Despite being the world's fifth-largest car market, India's adoption of electric mobility lags behind other nations. For instance, in Germany, 26% of vehicles are electric, compared to 18% in France and the UK, and 14% in Beijing (Singh et al. 2021). In stark contrast, the Indian EV market shows significantly lower penetration, with sales figures trailing far behind these countries (Gambhir 2017). In the fiscal year 2021, India produced 22.65 million vehicles, with 81% being two-wheelers, underscoring the nation's preference for this mode of transport (Jain 2022). However, only about 1.3% of these were electric two-wheelers. This study examines the perceptions of young Indian consumers towards electric two-wheelers using sentiment analysis on Twitter data. We identified key concerns and positive attitudes towards electric two-wheelers by analyzing tweets collected with relevant hashtags. The findings reveal a growing interest in EVs, yet significant barriers such as battery life, cost, and performance persist. These insights are crucial for policymakers and manufacturers to address consumer apprehensions and enhance EV adoption. The research underscores the importance of understanding consumer sentiment in shaping corporate social responsibility (CSR) initiatives and promoting pro-environmental behavior among employees. By leveraging these insights, organizations can develop targeted strategies that align with consumer expectations, foster a culture of sustainability, and contribute to a greener future. The study's implications extend to HR and marketing strategies, providing a foundation for developing comprehensive sustainability policies and innovative product development initiatives.

Link: [http://dx.doi.org/10.1007/978-3-031-90963-4\\_3](http://dx.doi.org/10.1007/978-3-031-90963-4_3)





## TITLE:

AURA: Advancing Human-Robot Interaction Through Unified Voice and Gesture Control

## AUTHOR :

Kumar L.; Anand P.; Ganpatye A.

## JOURNAL NAME:

2025 8th International Conference on Electronics, Materials Engineering and Nano-Technology, IEMENTech 2025

## DETAILS:

Published on 16 April 2025



## ABSTRACT:

The development of artificial intelligence (AI) assistants has revolutionized human-machine interaction, but traditional systems often rely on singular input modalities such as voice commands. This project, AURA: AI Robot with Unified Voice and Gesture Control, integrates voice and air gesture recognition to create a seamless and intuitive user interface. Utilizing a Raspberry Pi, camera, speaker, and microphone, the system combines computer vision and natural language processing to interpret user commands dynamically. The AI assistant is designed to respond accurately to both vocal instructions and gestures, enabling hands-free and voice-free operation in various scenarios. AURA's innovative approach enhances accessibility, convenience, and user experience, with potential applications in smart homes, healthcare, and personal robotics. This unified control mechanism demonstrates the future of multimodal interaction, emphasizing efficiency and adaptability in AI-driven systems.

Link:

<https://doi.org/10.1109/IEMENTech65115.2025.10959702>



### **TITLE:**

Machine learning-based framework for early prediction of diabetes

### **AUTHOR :**

Bhat S.S.; Selvam V.; Ansari G.A.

### **JOURNAL NAME:**

International Journal of Medical Engineering and Informatics (Vol.-17, Issue-3)

### **DETAILS:**

Published on 30 April 2025



### **ABSTRACT:**

The recent advancements in technology have changed the landscape of healthcare. With changes in lifestyle and rise in living standard diabetes remains the leading cause of death globally. Prediction of diabetes using machine learning algorithms (MLA) for early prediction is the need of the hour. However, it is still in its nascent stage. The goal of this study is to employ significant features of machine learning algorithms to the prediction of diabetic and to get the best results which are compared to clinical outcomes. Using predictive analysis, the suggested strategy focuses on choosing the features that aid in the early detection of diabetes. The result shows that the support vector machine (SVM) algorithm has the highest accuracy of 99.349% as compared to naive Bayes which is 98.95%. In order to improve classification and accuracy, this research also normalises the selection of suitable features in the data.

Link: <https://doi.org/10.1504/IJMEI.2025.145851>



## TITLE:

ART-UP: Making the case for visual thinking strategies in art therapy pedagogy, practice, and research

## AUTHOR :

Malhotra B.; Anand S.A.; Feen-Calligan H.;  
Callihan E.

## JOURNAL NAME:

Arts in Psychotherapy  
(Vol.-94)

## DETAILS:

Published on April 2025



## ABSTRACT:

Visual Thinking Strategies (VTS) is an art-education technique commonly used to enhance observation and critical thinking skills. Since the use of visual imagery is also the foundation of art therapy, integrating VTS in art therapy can foster clinical excellence and cultivate interprofessional collaboration across diverse settings. VTS can support professional learning by helping trainees and practitioners enhance key therapeutic skills such as Acceptance, Reflexivity, Thinking, Understanding, and Presence (ART-UP). This paper presents the authors' experiences as art therapists, researchers, and educators in utilizing VTS in art therapy teaching, medical research, and museum settings, illustrated through two vignettes. The first vignette describes using VTS in art therapy with burn patients at the bedside to foster art engagement via art viewing and facilitate psychosocial goals during recovery. The second vignette details a museum art therapy program designed for individuals with memory concerns and their care partners. Drawing from these vignettes and published literature, a third section describes the application of VTS to cultivate art therapy trainee's observation skills, enhance diagnostic assessments, recognize implicit biases, and broaden art therapy intervention to include observation and discussion of art works. Critical reflections are included to discuss the ways in which VTS can build bridges in art therapy. Interprofessional collaborations based on VTS protocol can encourage empathic dialogue when looking at and discovering the meaning of artwork in diverse settings.

Link: <https://doi.org/10.1016/j.aip.2025.102299>



## TITLE:

Improvement of Torsional Rigidity of Steel Supporting Structure Topside Module

## AUTHOR :

Yadhav A.; Kulkarni M.; Ingale D.

## JOURNAL NAME:

Journal of Mines, Metals and Fuels (Vol.-73, Issue-3)

## DETAILS:

Published on March 2025



## ABSTRACT:

The study investigates the improvement of torsional rigidity in floating support structures, focusing on the offshore industry's structural integrity needs. Offshore platforms, such as Floating Production Storage and Offloading (FPSO) units, face challenges due to dynamic environmental loads and long-term corrosion effects, which compromise structural rigidity and stability. To address these issues, the research evaluates multiple factors affecting torsional rigidity, including bracing configurations, material selection, and cross-sectional dimensions of structural components. The study utilizes STAAD Pro software to analyze FPSO structures under various loading conditions, including wind, wave, and operational loads, to identify critical torsional responses. Various bracing configurations were tested, with a focus on knee bracing patterns, which showed significant potential in enhancing structural stiffness and minimizing torsional deformation. Empirical data demonstrated that knee bracing effectively improves torsional performance by reducing displacement and increasing modal frequencies across a range of section sizes. By optimizing the unbraced length ratio ( $a/L$ ), the study highlights that larger sections with strategic bracing offer improved rigidity and vibration resistance, crucial for offshore stability under dynamic loading conditions. Recommendations from this research support industry-standard load combinations, providing a practical approach to enhancing torsional rigidity in floating offshore platforms. The findings contribute valuable insights into design optimization, promoting safer and more resilient offshore infrastructure. Major Findings: Knee bracing significantly improves torsional rigidity by reducing displacement and increasing modal frequencies. Improving torsional rigidity contribute to greater structural stiffness and vibration resistance, making structure more stable and resilient to dynamic environmental forces, particularly in harsh offshore conditions.

Link: <https://doi.org/10.18311/jmmf/2025/47817>





## TITLE:

Assessing global impacts of green transition:  
Role of traditional knowledge and intellectual  
property rights in climate change mitigation

## AUTHOR :

Ghose A.; Aamir Ali S.M.; Dhere A.; Inamdar P.

## JOURNAL NAME:

Adaptive Strategies for Green Economy and  
Sustainability Policies

## DETAILS:

Published on 30 January 2025



## ABSTRACT:

There will be biophysical, social, and economic consequences of climate change, which includes more than just a global trend of increasing temperatures or global warming' but also changes in regional climatic features like humidity, rainfall, and wind. Protection of traditional knowledge (TK) is the topic of this research, which examines the function of intellectual property policy and regulation in the context of climate change. This chapter shall examine how adaptive ability affects the link between traditional knowledge (including cultural ideas, practices, and personality qualities) and local inhabitants' economic well-being, taking climate change into consideration. To mitigate and adapt to climate change, this chapter will highlight the need to conserve traditional knowledge and intellectual property rights and provide various insights on how to preserve this knowledge for sustainable development and biodiversity.

Link: <http://dx.doi.org/10.2139/ssrn.5222536>





## TITLE:

Green finance in India: Exploring the intricacies of impact financing in emerging economies through cases

## AUTHOR :

Patil A.A.; Kanade A.

## JOURNAL NAME:

Adaptive Strategies for Green Economy and Sustainability Policies

## DETAILS:

Published on 7 March 2025



## ABSTRACT:

The world seeks sustainable and environmentally responsible solutions to its economic and environmental challenges. Emerging economies like India are caught up between the twin objectives of economic growth for meeting the needs of its populace and combating environmental challenges, to preserve the environment. In this context, green finance encompasses a range of financial instruments and investment strategies aimed at supporting projects that have positive environmental impacts. This article dwells into exploring case studies of a few public and private sector enterprises who have raised capital for green initiatives through green finance instruments, as well as understanding these instruments. These cases demonstrate the utilization of various financial tools, both domestic and foreign, to advance environmental causes, stimulate economic expansion, and reorient the country's trajectory towards a more sustainable and environmentally friendly future.

Link: <https://www.igi-global.com/chapter/green-finance-in-india/371819>



## TITLE:

Leveraging bound states in the continuum for advanced ultra-sensitive sensing technologies

## AUTHOR :

Thapa D.K.; Biswas S.

## JOURNAL NAME:

Materials Horizons

## DETAILS:

Published on April 2025



## ABSTRACT:

Traditional sensing methods, such as ELISA, PCR, and electrochemical sensors, face challenges like limited sensitivity, high costs and complex sample preparation. In contrast, optical sensors, particularly surface plasmon resonance (SPR) and dielectric-based guided-mode resonance (GMR) sensors have emerged as promising alternatives. These sensors offer non-invasive measurements, remote readouts, and enhanced sensitivity. While SPR sensors benefit from high local sensitivity, they are limited by energy losses in the metal, reducing the overall quality-factor (Q). On the other hand, GMR sensors, which use low-loss dielectric materials, achieve higher Q factors but are constrained by their inability to effectively detect biomolecules located farther from the sensor surface. Recently, materials that support bound states in the continuum (BICs) have attracted attention for their potential to achieve infinite Q factors, resulting in ultra-narrow resonance linewidths, exceptional precision, and enhanced light-matter interaction. These features make BICs highly promising for sensing applications. This review offers an in-depth understanding of BICs, explaining their principles, including the topological nature of BICs, and exploring recent advancements in BIC-based refractive index sensing technologies. It focuses on material platforms such as dielectric, plasmonic, and hybrid materials that host BICs. Additionally, the review addresses challenges in the field and suggests potential solutions.

Link: <http://dx.doi.org/10.1039/D5MH00413F>



## TITLE:

A Comprehensive Review of the Real Estate Act,  
2016: Challenges and Opportunities

## AUTHOR :

Minde P.; Patil M.

## JOURNAL NAME:

AIP Conference Proceedings (Vol.-3305, Issue-  
1)

## DETAILS:

Published on May 2025



## ABSTRACT:

The Indian construction industry is a major contributor to the country's economic growth, encompassing residential, commercial, infrastructure, and industrial projects. The Real Estate (Regulation and Development) Act, 2016 (RERA) is a significant legislative intervention to transform India's real estate sector. Despite being in effect since 2016, RERA faces numerous challenges, including delayed possession, lack of awareness, data management issues, developer resistance, and difficulties in implementing judgments passed by RERA authorities. This study focuses on a literature review, surveys, and interviews with clients (allottees) and developers, with findings based on case studies. The results highlight the need for improvements such as streamlining processes, enhancing regulatory oversight to ensure proper implementation of judgments, and investing in skill development to mitigate delays and improve project outcomes. By aligning with principles of sustainable development, such as promoting energy efficiency and green building practices, RERA can contribute to creating resilient and environmentally friendly urban spaces. With strategic interventions and a focus on sustainability, RERA has the potential to drive positive change in India's real estate sector, fostering economic growth while promoting environmental and social well-being.

Link: <https://doi.org/10.1063/5.0269131>



## TITLE:

Enhancing Flat-Plate Solar Collector Efficiency:  
A Numerical Study

## AUTHOR :

Kurhade A.S.; Amruth E.; Joshi P.S.; Kondhalkar  
G.E.; Jadhav P.A.; Murali G.; Mahajan R.G.;  
Waware S.Y.

## JOURNAL NAME:

Journal of Mines, Metals and Fuels (Vol.-73,  
Issue-4)

## DETAILS:

Published on April 2025



## ABSTRACT:

This study explores the improvement in performance of flat-plate solar collectors by integrating hybrid Photo-Voltaic (PV)-thermal systems. Numerical simulations were performed using ANSYS software, incorporating Computational Fluid Dynamics (CFD) and steady-state thermal modeling. The research focused on a circular-section PV/T collector exposed to solar irradiation of  $1000 \text{ W/m}^2$ , with ambient and inlet water temperatures set at  $288 \text{ K}$ . Three different flow rates ( $0.02$ ,  $0.025$ , and  $0.03 \text{ kg/s}$ ) were examined to determine their effects on collector efficiency and water outlet temperature. Two configurations were analyzed: one without a glass cover (steady-state analysis) and another with water cooling (CFD). The findings revealed that increasing the flow rate from  $0.02$  to  $0.03 \text{ kg/s}$  significantly lowered the panel's heating rate, enhancing efficiency but reducing water output. Future research aims to develop PV cells with improved photon absorption to maximize both electrical and thermal energy production. Furthermore, adding extra layers within the panel could optimize heat transfer and boost overall performance. These hybrid systems' capability to generate electricity and thermal energy under diverse atmospheric conditions, such as dust, clouds, and snow, sets them apart from conventional collectors and highlights their potential for sustainable energy solutions.

Link: <https://doi.org/10.18311/jmmf/2025/48249>





## TITLE:

Unlock Professional Growth, Networking, and Recognition With IEEE Women in Engineering: Discover the benefits and opportunities

## AUTHOR :

Ye W.; Jain P.

## JOURNAL NAME:

IEEE Women in Engineering Magazine (Vol.-19, Issue-1)

## DETAILS:

Published on 23 April 2025



## ABSTRACT:

Imagine being part of a global network that propels your career forward and enriches your personal life. Joining IEEE Women in Engineering (WIE) offers many benefits, from professional development to personal fulfillment. A global network, WIE provides a platform for women and their allies in science, technology, engineering, and mathematics (STEM) to connect, collaborate, and advance their careers. Here, we highlight the value proposition of becoming a WIE member, the benefits of volunteering, and the progression through the volunteering ranks, including achieving Senior Member and IEEE Fellow status.

Link: <https://doi.org/10.1109/MWIE.2025.3547541>





## TITLE:

Democracy, Leadership and Governance  
Application of Artificial Intelligence: A Machine  
Generated Overview

## AUTHOR :

Gireesan K.; Chathukulam J.

## JOURNAL NAME:

Democracy, leadership and governance –  
application of artificial intelligence: A machine-  
generated overview

## DETAILS:

Published on 2024



## ABSTRACT:

In today's rapidly evolving political landscape, the intersection of democracy, leadership, and governance with artificial intelligence (AI) has become a focal point for academic inquiry and practical explorations. This book is a machine-generated literature overview that explores the opportunities, challenges, and impacts of integrating AI technologies in democratic processes, leadership dynamics, and sustainable governance. Through a collection of thought-provoking chapters, readers will gain insights into the transformative potential of AI that revisits the tenets of deliberative democracy, redefines leadership roles, and rejuvenates public service delivery. This volume offers a comprehensive exploration of the processes and practices of democratic decision-making, leadership development, and sustainable governance. It serves as a valuable resource to academics, policymakers, and practitioners navigating through the concepts, dimensions, and praxis of democracy, leadership, and governance. It is an important value addition to the body of knowledge and paves the way for informed decision-making and responsible application of digital technologies for good governance.

Link: <https://link.springer.com/book/10.1007/978-981-99-7735-2>



## TITLE:

Edible Polymers and Their Applications in Food Packaging and Other Areas

## AUTHOR :

Deshpande P.

## JOURNAL NAME:

Specialty Polymers and Materials: Advances, Technologies, Applications, and Future Trends

## DETAILS:

Published on 1 January 2025



## ABSTRACT:

Natural polymers are significant compounds made from sustainable plant, animal, and algal genesis in addition to leftovers from the agricultural industry. Until they were superseded by petroleum-based plastic materials during World War II, few of them were historically extensively utilized by ancient races for food packaging. Compared to traditional, ecologically unfriendly materials, edible polymers can decrease the convolution of materials, thereby increasing the recyclability of materials, and are capable of replacing synthetic polymers. Bio-based materials for packaging food are gaining popularity today. Its use is increasing, particularly as a result of the environmental damage brought on by improper plastic packaging disposal. Because of their many benefits, including biodegradability, biocompatibility, and low toxicity, bio-based materials are encouraged in the pattern of packaging food. Few biopolymer-based packaging may exhibit good barrier qualities, antibacterial activity, and antioxidant activity, depending on the formulation. Hence, proteins and polysaccharides are mixed to form composite films which shows better biological and mechanical properties, making them suitable for packaging a variety of food goods. All living organisms can easily consume edible polymers, which are mainly composed of polysaccharides, proteins, and lipids, without any ill effects on their health. Edible polymers have found widespread use in the industrial, biomedical, agricultural, cosmetics, and food packaging sectors over synthetic polymers because of their unique property of biodegradability and compatibility with the environment. This chapter provides a comprehensive introduction to edible polymers, their compositions, properties, and potential applications in the food packaging industry and other fields such as cosmetics, tissue engineering, pharmaceuticals, and wastewater treatment.

Link:

<https://www.taylorfrancis.com/chapters/edit/10.1201/9781003561361-5/edible-polymers-applications-food-packaging-areas-pradnya-deshpande>





## TITLE:

Image to Insight: AI Solutions for Air Pollution Detection and Control in Smart Cities

## AUTHOR:

Behl G.; Shahane D.; Patil P.S.; Kaur B.; Rroy A.D.

## JOURNAL NAME:

Indian Journal of Environmental Protection (Vol.-44, Issue-15)

## DETAILS:

Published on 2024



## ABSTRACT:

Air pollution poses significant health and environmental challenges in today's urban centres, necessitating advanced detection and control strategies. In this study, we focus on leveraging image data for air pollution identification in smart cities. The air quality image dataset used in our research is sourced from Kaggle, titled 'air pollution image dataset from India and Nepal'. The dataset comprises 12,240 images, each with dimensions of 224 x 224 pixels, categorized into distinct air quality index (AQI) levels, ranging from good to hazardous/severe. To enhance the quality and suitability of the image data for analysis, we perform preprocessing steps, including grayscale conversion, noise removal and reseating. Subsequently, we extract essential features from the images using the gray-level co-occurrence matrix (GLCM) method, a well-established approach for texture classification in image analysis. Furthermore, to optimize extracted features, we employ two powerful optimization algorithms: elephant search algorithm (ESA) and cat swarm optimization (CSO). The GLCM features, as well as the optimized ESA and CSO features, are fed into a convolutional neural network (CNN) model for classification. The performance of the CNN model is thoroughly evaluated and most effective optimization technique is identified. The chosen optimization technique is then implemented in a mobile app tailored for smart cities. The mobile app allows individuals to monitor their surrounding environment's air quality by capturing and uploading images from their surroundings. In the event of the air pollution level being deemed 'unhealthy' or 'hazardous/ the app accesses the user's location data and automatically notifies the local government. This real-time information empowers the government to take prompt and appropriate actions to mitigate pollution sources and improve air quality in the affected areas. The deployment of this mobile app in smart cities fosters a citizen-centric approach to air pollution control.

Link: <https://www.e-ijep.co.in/44-15-1318-1326/#:~:text=The%20mobile%20app%20allows%20individuals,based%20on%20the%20AQI%20categories.>



## TITLE:

An effective approach for predicting daily stock trading decisions using fuzzy inference systems

## AUTHOR :

Venugopal R.; Veeramani C.; Muruganandan S.

## JOURNAL NAME:

Soft Computing (Vol.-28, Issue-4)

## DETAILS:

Published on 28 November 2023



## ABSTRACT:

To achieve success in stock trading, the ability to forecast future market behavior is crucial. Many professional traders favor traditional technical indicators as their preferred price projection method. However, making decisions based on various information sources can enhance the accuracy of market predictions. To address this, we have developed fuzzy inference systems (FISs) that utilize fundamental and technical data as inputs, enabling daily trading decisions such as buy, hold, and sell signals. The results of our study indicate that the incorporation of fundamental financial data alongside technical data significantly enhances the accuracy of predicting future prices compared to systems relying solely on past price data. To further assess the effectiveness of our FISs, we conducted t-tests to compare their results with those of traditional technical trading strategies and the Buy–Hold strategy. The outcomes of the t-tests confirm that the proposed FISs outperform both the Buy–Hold strategy and traditional technical trading strategies, including RSI, MACD, and SO.

Link: <https://doi.org/10.1007/s00500-023-09383-3>



### TITLE:

A Study of the Relationship among Supply Chain Performance Management Factors and Organizational Performance of Manufacturing Industries

### AUTHOR :

Raj K.B.; Murthy S.S.; Gandhi D.J.; Adhav S.

### JOURNAL NAME:

Essentials of Supply Chain Management:  
Strategy, Planning, and Operations

### DETAILS:

Published on December 2022



### ABSTRACT:

Over the last several years, supply chain management has been more important to a company's bottom line. In today's competitive market, researchers must focus on finding new and better methods to satisfy consumers. Having a shorter product life cycle and more frequent new product advancements and enhancements are highly valued in today's business climate, which is more global and competitive than in the past. Not only that, but modern consumers have access to cutting-edge tools and resources because to the proliferation of information technology. Because of the urgency of the situation, businesses must train for increased creativity and fierce competition in order to be ready to respond quickly. The objectives of the study are to investigate the most current advancements in supply chain management and the role that this field has played in the growth of the economy and to investigate the impact of the supply chain management practices on the performance of the company. The study has been carried in Chennai city with a sample of 100 MSMEs which are randomly selected. The MSME units which are in the manufacturing and service sectors are considered for the study. The practice of supply chain management and its impact on the performance of the company (performance based on sales) is observed from the respondents through the questionnaire. The author concluded from the result that Close partnership with customers, holding safety stock, many suppliers, outsourcing, strategic planning and subcontracting are having significant influence on the sales performance of the companies.

Link:

<https://www.pnrjournal.com/index.php/home/article/view/5136>



## TITLE:

Machine Learning Based Perspectives For  
Housing Market Crash Prediction

## AUTHOR :

Sahoo S.; Rao M.; Rath S.; Patel D.K.; Khuntia  
M.; Swagatika S.; Jena S.S.; Sahu P.K.

## JOURNAL NAME:

Journal of Theoretical and Applied Information  
Technology (Vol.-103, Issue-9)

## DETAILS:

Published on 15 May 2025



## ABSTRACT:

The recession of 2008, commonly referred to as the "Subprime Mortgage Crisis," was the worst to hit the USA and had an impact on the entire world, costing more than 8.4 million people their employment alone in the USA. From late 2006 to the end of 2009, the crises repeatedly forced innocent people to leave their homes, and the Gross Domestic Product (GDP) dropped as low as 4.3%. In order to assist in estimating future market values and prices so that a real estate market recession can be averted, this working paper analyses old and present prices, levels, and interest rates to determine at what rate the market could have been rescued from falling. A house market crash prediction with machine learning techniques including Linear Regression, Hidden Markov Model, and Long Short Term Memory is presented here.

Link: <https://www.scopus.com/record/display.uri?eid=2-s2.0-105004987023&origin=resultslist&sort=plf-f&src=s&sot=b&sdt=b&s=TITLE-ABS-KEY%28MACHINE+LEARNING+BASED+PERSPECTIVES+FOR+HOUSING+MARKET+CRASH+PREDICTION%29&sessionSearchId=ff5b50ae485860482096f0bd28d81c69>





## TITLE:

Creative paradigms, generative AI, and copyright law: Investigating the intersection of AI and artistry

## AUTHOR :

Ghose A.; Aamir Ali S.M.; Deshmukh S.B.

## JOURNAL NAME:

Exploration of AI in Contemporary Legal Systems

## DETAILS:

Published on January 2025



## ABSTRACT:

In recent years, owing to significant advancements in deep learning technology, artificial intelligence (AI) has started to replace human content creators and produce quality creative works on a wide scale. By the end of the decade, it is probable that a substantial quantity of art, literature, music, software, and online material will be generated by AI instead of conventional human creators. However, the law is not keeping pace with this technical advancement since it now prohibits granting copyright protection to works created by artificial intelligence. The aim of this chapter is to examine the intricacies of this expanding artistic field, specifically examining the modern techniques used by those who utilize AI to augment and amplify their creative pursuits.

Link: <http://dx.doi.org/10.4018/979-8-3693-7205-0.ch006>



## TITLE:

The Impact of Matrix Headlights on Road Safety and Driver Experience

## AUTHOR :

Kunjir A.M.; Shinde S.U.; Raut V.

## JOURNAL NAME:

Journal of Mines, Metals and Fuels (vol.-73, Issue-4)

## DETAILS:

Published on 16 April 2025



## ABSTRACT:

Matrix headlights, employing arrays of individually controlled Light Emitting Diode (LEDs) or laser diodes, revolutionise automotive lighting by dynamically adapting to real-time driving conditions. This technology enables high-beam usage without blinding other drivers while enhancing driver awareness through the projection of road-based patterns and signals. By combining advanced optics, electronics, and intelligent software, matrix headlights offer unprecedented control and adaptability, significantly improving road safety and driving experiences. Research studies have demonstrated the potential of matrix headlights to provide adaptive, energy-efficient, and safety-enhancing solutions compared to traditional lighting systems. However, challenges such as calibration complexity, scalability issues and limitations in handling extreme environmental conditions need to be addressed for widespread adoption.

**Major Findings:** Matrix headlights utilise arrays of individually controlled LEDs or laser diodes to dynamically adjust the light beam, preventing glare for oncoming drivers while maintaining high-beam visibility. These systems enhance driver awareness by projecting road-based patterns and signals, improving safety in challenging conditions. While offering significant advancements in safety and efficiency, challenges such as calibration complexity and environmental limitations need to be addressed for widespread adoption.

Link: <https://doi.org/10.18311/jmmf/2025/48184>



## TITLE:

Control of Machine Learning Algorithms in Stock Trading

## AUTHOR :

Doifode A.; Bhosale T.; Pillai D.; Singh A.S.

## JOURNAL NAME:

Lecture Notes in Networks and Systems  
(Vol.1302)

## DETAILS:

Published on May 2025



## ABSTRACT:

Artificial intelligence (AI) applications in investments have gained a lot of attention from researchers since the late 1990s when personal computers were more widely used and technology advanced more quickly. Since then, numerous strategies have been implemented to deal with the problem of forecasting stock market movements. The three domains into which the research papers were categorized were investment sentiment analysis, stock market estimation using AI, and portfolio optimization. Furthermore, the synthesis of the review indicates that the topic has attracted the interest of academicians and thus the research area is getting more comprehensive and in-depth. The machine learning models are increasingly utilized in algorithmic trading and portfolio management. The growing application of machine learning for the financial markets pushes current modeling and model implementation procedures to the test. It raises the need for workable solutions to handle the complexity associated with these methods.

Link: [http://dx.doi.org/10.1007/978-981-96-3381-4\\_23](http://dx.doi.org/10.1007/978-981-96-3381-4_23)





## TITLE:

An Improvised Way Towards Development of Multipurpose Application

## AUTHOR :

Ware P.; Huddar C.; Pednekar V.; Kulkarni P.;  
Bhamare M.

## JOURNAL NAME:

Proceedings - 2024 International Conference on  
Progressive Innovations in Intelligent Systems  
and Data Science, ICPIDS 2024

## DETAILS:

Published on 29 April 2025



## ABSTRACT:

The Android Development domain has expanded a lot over the period of time. Over the course, it provided usage and deployment of multi-purpose applications that provided multiple functions in a single application. The system, due to a lack of proper implementation, degraded over a period of time proving it to be inefficient. The systems were expensive to develop and were difficult to maintain. The main drawback was that modules were too independent under the same application. The proposed system provides a better framework about the same concept that highlights the drawbacks earlier systems had and the inefficiency of the available solution. It complies with the basics of architectural development of any application. The primary change is in re-modelling the structure of the development that creates an opportunity to test and deploy mobile applications with better productivity and efficiency. The application is divided into two parts, Frontend and Backend. The Frontend purely consists of the GUI development of android application. The backend provides connectivity to cloud storage provided by Firebase. The Frontend and Backend together produce a single platform which then in turn is divided into four main modules. The modules provided are combined under a single platform to provide better data integrity, reusability, connectivity and modularity between various modules. The domain explored is in the educational sector. It provided a perfect platform to test the product in a growing industry.

Link: <https://doi.org/10.1109/ICPIDS65698.2024.00014>



## TITLE:

Optimization of Non-convex Loss Functions in  
Neural Network Training

## AUTHOR :

Advani P.; Behele S.; Atal K.; Pandya M.; Gutte  
V.

## JOURNAL NAME:

Lecture Notes in Networks and Systems (Vol.-  
1245 LNNS)

## DETAILS:

Published on 4 May 2025



## ABSTRACT:

This paper presents a novel approach to optimize the non-convex loss functions used in neural networks using powerful parallel computing language Julia. There are two types of loss functions- convex, where there is only one local maximum, and non-convex loss function where there are multiple local minima. To get most optimal results in model evaluation, reaching the global minima is preferred. This paper proposes a method to reach the global minimum and thus optimize the non-convex loss functions by using the optimization algorithms in the Julia packages. In this paper, we have used the IPOPT (Interior Point Optimizer) package to find the global minimum in loss functions so that the neural network's accuracy increases and we have maximum convergence between model output and target value. This paper also provides detail comparison between other loss function optimization algorithms and the Interior Point Method, which we have adopted for this research paper.

Link: [https://link.springer.com/chapter/10.1007/978-3-031-81083-1\\_14](https://link.springer.com/chapter/10.1007/978-3-031-81083-1_14)



## TITLE:

Harnessing Functionalized Biochar for  
Enhanced Electrochemical Properties in  
Secondary Batteries

## AUTHOR :

Sonawane R.; Kandasubramanian B.

## JOURNAL NAME:

Journal of Electronic Materials

## DETAILS:

Published on 13 May 2025



## ABSTRACT:

In recent years, considerable attention has been drawn to the potential applications of biochar, particularly in the energy sector and various other industries. However, its applications in electrochemistry, particularly as a hard carbon precursor for secondary batteries, are increasing. This study seeks to assess the viability of utilizing biochar derived from different types of biomass for applications in secondary batteries. This review also aims to establish links between the characteristics of the biomass and its electrochemical behaviour of the resulting hard carbon material. Biochar is a material created from organic waste such as agricultural residues and municipal sewage sludge. Recent research highlights its potential energy storage, including secondary batteries. This review explores the modification and applications of biochar with a focus on secondary battery systems, based on insights from over 200 research works published over the last 13 years (2011–2024). The attributes of biochar are strongly influenced by the choice of feedstock and the techniques used for its production. Techniques including pyrolysis, gasification, and hydrothermal carbonization are commonly used. To enhance its performance for specific applications, biochar can be modified using acids, alkalis, oxidants, metal ions, or carbon-based additives. In secondary batteries, such as lithium-ion batteries, biochar is emerging as a sustainable electrode material. Its porous architecture and excellent electrical conductivity render it ideal for improving charge/discharge capacity and cycling durability. Recent studies show that biochar-derived anodes demonstrate improved electrochemical performance.

Link: <http://dx.doi.org/10.1007/s11664-025-12020-4>



## TITLE:

Role of Exosomes in Management of Depression

## AUTHOR :

Nigade A.; Pathak G.; Anitha K.; Mishra N.; Bali V.; Bhatt S.

## JOURNAL NAME:

Exosomes Based Drug Delivery Strategies for Brain Disorders

## DETAILS:

Published on 31 March 2024



## ABSTRACT:

Depression or major depressive disorder (MDD) is a disease that is characterized by prolonged sad mood. In most of the cases, the disorder is presented with other comorbid illnesses such as anxiety, Alzheimer's disease (AD), obesity, and diabetes. Most of the drugs used for the treatment are targeting the levels of monoamines, namely serotonin, dopamine, and norepinephrine in the synapse. Most of the drugs showed their effect after 4–6 weeks of treatment as they are working via modification of receptors. In addition, adverse effects, treatment resistance, and poor outcomes of the available treatment have urged the need for novel and promising therapeutic options. Exosomes are extracellular vesicles (EVs) of endocytic origin. These vesicles are secreted or released by cells and found in bio-fluids such as urine, plasma, and saline. These vesicles are having a role in various vital processes of the body and are made up of small RNA, DNA, and proteins. These vesicles may play an important role in various physiological processes such as cell-to-cell communication, neurogenesis, and synaptic plasticity. One of the important advantages of exosomes is that they are able to cross blood–brain barrier (BBB). Moreover, exosomes are capable of transferring DNA, protein, mRNAs, and miRNAs to recipient cells. This chapter enlightens the potential role of exosomes in MDD and their utilization as a therapeutic option or diagnostic tool for depression.

Link: [http://dx.doi.org/10.1007/978-981-99-8373-5\\_8](http://dx.doi.org/10.1007/978-981-99-8373-5_8)



## TITLE:

Coherently coupled optical spatial solitons in polymeric media

## AUTHOR :

Katti A.

## JOURNAL NAME:

Journal of Nonlinear Optical Physics and Materials

## DETAILS:

Published on March 2025



## ABSTRACT:

We show, for the first time, the existence and characteristics of coherently coupled optical spatial soliton pairs in biased photorefractive polymers under steady-state conditions. The theoretical formulation is set up using the coupled paraxial Helmholtz equations and the conditions for the existence of the bright, dark and gray coherently coupled soliton pair in polymeric media have been found. These soliton pairs can be established provided that the collinearly propagating carrier beams have the same polarization and wavelength, and are mutually coherent. We find that the coherently coupled soliton spatial profiles and soliton pair width are profoundly affected by the intensity ratio, phase difference between the incident coherent beams and the strength of the external bias field. The effect of these parameters is studied in detail for all three cases of bright, dark and gray coherently coupled soliton pairs. We study the stability of these coherently coupled soliton pairs against small perturbations by the numerical beam propagation method. The bright coherently coupled soliton pairs are found completely stable, while dark and gray coherently coupled soliton pairs exhibit instability on the uniform background.

Link: <https://doi.org/10.1142/S0218863525500237>



## TITLE:

Eighteen months of non-union of an upper third tibial fracture treated with Ayurvedic herbal medicines and Panchakarma: A case report

## AUTHOR :

Sardeshmukh S.P.; Hardikar S.; Prakash S.;  
Nimbalkar R.G.; Pawar A.T.; Baheti A.M.;  
Nimbalkar M.R.

## JOURNAL NAME:

Journal of Ayurveda and Integrative Medicine  
(Vol.-16, Issue-3)

## DETAILS:

Published on May 2025



## ABSTRACT:

In the present case, a 29-year-old male met with a road traffic accident and sustained a closed comminuted fracture of the upper third (U/3) of the tibia of his left leg. The patient was operated (Open Reduction Internal Fixation, ORIF) with internal nailing. Even after 18 months, the fracture line was visible in the X-ray, so he was re-operated (ORIF) and the nail was replaced by plate fixation. However, after the second operation, the patient developed foot drop and hyperesthesia due to peroneal nerve injury. In view of this complicated history, the patient was suggested to take supportive Ayurvedic medicines and Panchakarma to hasten the healing process. The Ayurvedic medicines Lakshadi guggul 500 mg, Mashadi Yoga 500 mg and Asthi majja yoga 500 mg three times a day were started. The follow-up X-ray examination after eight months of treatment didn't show considerable callus at the fracture site, so Panchakarma therapy was given for 21 days. Callus formation was seen within 3 weeks after completing Panchakarma treatment. The oral medications were continued and a follow-up X-ray examination on two more months of treatment showed near complete healing (Fracture line was obliterated because of considerable callus). The medicine was continued for two more months. Afterwards, the patient came back after one year and the follow-up X-ray examination showed complete healing. The internal plate was removed and complete fracture recovery was reported. Thus, a patient with a non-union fracture of the tibia was treated successfully with add-on Ayurvedic medicines and Panchakarma therapy.

Link: <https://doi.org/10.1016/j.jaim.2024.101105>



## TITLE:

Influence of key economic factors on exchange rate using vector error correction method: The case of India

## AUTHOR :

Kumar M.; Patil A.A.; Randive K.; Gaurav K.

## JOURNAL NAME:

Investment Management and Financial Innovations (Vol.-22, Issue-2)

## DETAILS:

Published on 21 May 2024



## ABSTRACT:

The relationship between exchange rates and key economic factors is crucial and may vary across countries depending on the economic context. This paper analyzes cointegration relationships among exchange rate, balance of payments, interest rate, inflation, and trade openness using the Johansen Cointegration Test in the context of the Indian economy. The study uses annual time-series data from 2008 to 2024. Stationarity of the variables is first tested using the Augmented Dickey-Fuller test. The Johansen Cointegration Test is then applied to identify long-run equilibrium relationships, while a Vector Error Correction Model captures short-term dynamics and adjustments towards equilibrium. The exchange rate makes modest adjustments across cointegrating relationships, sometimes restoring equilibrium, other times diverging from it. The balance of payments shows large coefficients, primarily amplifying deviations. The interest rate has minimal adjustment, showing little response to disequilibrium. Inflation and trade openness have small, negative coefficients, indicating weak correction toward equilibrium. Overall, the balance of payments amplifies deviations, while other variables show varying degrees of error-correcting behavior. The model explains 67.4% of the variation in exchange rate changes ( $R\text{-squared} = 0.674$ ), with an adjusted  $R\text{-squared}$  of 0.5, accounting for predictors. The F-statistic (3.87,  $p = 0.0115$ ) shows the model is statistically significant. Short-run changes in the exchange rate are influenced by past exchange rates, balance of payments, inflation, and trade openness, while interest rates play a minimal role.

Link: [http://dx.doi.org/10.21511/imfi.22\(2\).2025.22](http://dx.doi.org/10.21511/imfi.22(2).2025.22)



## TITLE:

Framework for Measuring the Impact of Islamic Corporate Governance on Sustainable Growth

## AUTHOR :

Srivastava S.; Singh M.; Srivastava S.P.

## JOURNAL NAME:

Islamic Finance and Corporate Governance:  
Synergies for Sustainable Growth

## DETAILS:

Published on 23 April 2025



## ABSTRACT:

Islamic corporate governance (CG) plays a significant role in ensuring the sustainability of organizations' growth by aligning it with the objectives of Shariah. It promotes Shariah values and fosters a culture of trust that safeguards against wastage, extravagance, fraud, and misuse of power by those in governance. This chapter reviews Islamic CG, highlighting its differences from conventional CG and its relevance to sustainable growth. The principle of socially responsible behavior in religious-based economic systems is employed to interpret how contemporary organizations should be governed, and the objectives of stakeholders are considered in business operations and spiritual obligations. The Islamic economic model has great potential to encourage a unique perspective on the role of stakeholders, which is implemented through the inclusive process of CG. Responsible investing is based on the ethical core principles of faith and connection between capitalism and religions. The Islamic world distinguishes between capitalism and material success and capitalism and moral management. The study establishes the impact of Islamic CG on the dynamics of sustainable growth and development of a company from a wide array of measures so as to overshadow corporate growth, employees' involvement, ethical and transparency issues, tackling macroeconomic issues to promote smooth state balance sheet formation, and much more. Behavioral CG relies upon credible ethical practices that align all stakeholders and shareholders in a company's business, a sound corporate infrastructure, social cooperation, and a high-quality legal framework.

Link: <https://doi.org/10.1108/978-1-83662-346-520251005>



## TITLE:

Review on optimised process parameters of bioethanol production for environmental sustainability

## AUTHOR:

Deshmukh M.P.; Pendse D.S.

## JOURNAL NAME:

Materials Research Proceedings (Vol.-53)

## DETAILS:

Published on May 2025



## ABSTRACT:

Water hyacinth is a commonly grown aquatic plant. It causes a menace in water bodies due to its large mat formation. It is removed from water bodies through physical, chemical, or biological methods. These methods are costly and ineffective as the plant grows again quickly. Since the plant is easily available, it has been explored as a potential source of lignocellulose biomass for biofuel production. This review paper reflects upon the important steps in processing water hyacinth plants for producing biofuel. A quick summary of the research concerning pre-treatment methods, enzyme hydrolysis, and fermentation studies shows that acid pre-treatment followed by cellulase enzyme hydrolysis and using acidic conditions for fermentation up to 3 days at room temperature gives optimum ethanol and sugar yields. The main challenge in the commercialization of bioethanol production from water hyacinth biomass is the low ethanol yield obtained as compared to other feedstock like sugarcane bagasse and corn stover. However, from an environmental point of view, by converting waste biomass into a valuable energy resource, bioethanol production from water hyacinth promotes a circular economy and sustainable resource management.

Link: <https://doi.org/10.21741/9781644903575-4>



## TITLE:

Essential Oil and Its Bioactivity Toward  
Honeybees

## AUTHOR:

Deshpande P.; Naik D.

## JOURNAL NAME:

Encyclopedia of Green Materials

## DETAILS:

Published on 27 December 2024



## ABSTRACT:

Essential oil obtained from plants is a concentrated hydrophobic liquid containing volatile chemical compounds, which show repellent behavior toward honeybees. The repellent behavior of honeybees toward essential oil is one of the practically effective tools to keep the honeybees away from areas, which are recently treated with toxic insecticides during pollination.

Honeybees visit various plants around their colonies for collecting nectar and pollen. Pollination, which is an important activity, gets executed in these visits. Although honeybees get pollen from flowers, they may get nectar from flowers or from any other part of the plant. Thus while foraging for food, honeybees come into intimate contact with plants. If some pesticides are sprayed on the plants, honeybees get exposed to them. With this exposure, not only the honeybees get exposed to the chemicals, but also the colony as a whole gets affected.

Link: [http://dx.doi.org/10.1007/978-981-97-4618-7\\_129](http://dx.doi.org/10.1007/978-981-97-4618-7_129)



*Published on May 2025*

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