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# FACULTY PUBLICATION

## RESEARCH PAPERS

June-2025



## TITLE:

Revival and preservation of folklore through tourism: Approaches for the sustainable cultural heritage management in India

## AUTHOR :

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

## JOURNAL NAME:

Community Development Insights on Cultural Heritage Tourism

## DETAILS:

Published on 13 May 2025



## ABSTRACT:

This chapter examines the role of tourism in the revival and preservation of folklore, focusing on sustainable cultural heritage management in India. It explores how tourism can be harnessed to revitalize traditional practices and performances, providing economic benefits that support the maintenance of cultural heritage. However, it also addresses challenges such as the risk of commercialization and the potential loss of authenticity. Effective management strategies include integrating legal frameworks, such as intellectual property rights, to protect traditional knowledge and developing policies that balance economic and cultural interests. The analysis stresses community engagement in policy formation and best practices for incorporating and respecting local opinions. India can preserve its rich folklore history by balancing cultural preservation and economic growth with legislative safeguards, community participation, and sustainable tourism.

Link: <https://www.igi-global.com/chapter/revival-and-preservation-of-folklore-through-tourism/379835>



## TITLE:

Spherical Chitosan Hydrogel Particles as a Biosorbent for the Removal of Azo Dyes from Wastewater

## AUTHOR :

Poduval V.; Khurpade P.D.

## JOURNAL NAME:

Lecture Notes in Civil Engineering (Vol.-581)

## DETAILS:

Published on 21 May 2025



## ABSTRACT:

Azo dyes laden wastewater is discharged into waterbodies from various industries such as textile, leather, food, cosmetics, printing, etc., without any proper treatments. Therefore, simple, cost-effective, environment-friendly and efficient methods to treat dye-containing wastewater are essential to avoid their toxic effects on the environment and human health. The main objective of this study is to synthesize spherical chitosan hydrogel particles and their utilization for the removal of azo dye namely methylene blue from wastewater. Recently, chitosan as a bio-based adsorbent has gained attention due to its unique characteristics of biodegradability, sorption capacity, stability and easy availability. In this study, chitosan hydrogel particles were synthesized through precipitation method using alkaline medium and then oven dried. The effect of adsorbent dosage, initial dye concentration and contact time on dye removal efficiency were studied. The final dried chitosan hydrogel particles (CHPs) were in spherical shape with the size ranges between 1.60–1.80 mm. Furthermore, the structure and morphology of prepared CHPs were analyzed using Fourier Transform Infrared spectroscopy (FTIR) and Scanning Electron Microscopy (SEM) analysis and dye removal efficiency was evaluated using UV–Visible spectroscopy. The adsorption isotherm and kinetics of adsorption data fitted well to the Freundlich isotherm model and pseudo second order kinetic model (with  $R^2 > 0.98$ ). Result analysis revealed that good methylene blue dye removal efficiency (greater than 80%) was achieved using chitosan hydrogel particles as a biosorbent. The present findings demonstrate that chitosan-based hydrogel particles can be utilized as an effective biosorbent for the removal of azo dyes from industrial wastewater.

Link: [http://dx.doi.org/10.1007/978-981-96-2092-0\\_9](http://dx.doi.org/10.1007/978-981-96-2092-0_9)



## TITLE:

In-Depth Investigation Of Flow Measurement  
Using Sharp-Edged Width Constriction In  
Trapezoidal Open Channels

## AUTHOR :

Achour B.; Amara L.; Kulkarni K.H.

## JOURNAL NAME:

Larhyss Journal (Vol,-2025, Issue-62)

## DETAILS:

Published on June 2025



## ABSTRACT:

Flow measurement in open channels is a critical aspect of hydraulic engineering, essential for effective water resource management, irrigation, environmental monitoring, and industrial applications. The present study investigates the feasibility of using a sharp-edged width constriction as a reliable and efficient flow measurement device in trapezoidal open channels. The proposed device, which has already demonstrated its effectiveness in rectangular channels, consists of two thin vertical plates forming a full central rectangular opening, creating a lateral flow contraction. Its geometric simplicity, cost-effectiveness, and ease of implementation make it a promising alternative to conventional flow measurement structures. The primary objective of this study is to establish a rigorous theoretical framework governing the discharge coefficient ( $C_d$ ) of the device and validate it experimentally. The discharge coefficient, a crucial parameter in flow measurement, accounts for contraction effects, energy losses, and variations in velocity distribution. A comprehensive theoretical analysis is conducted using two independent methodologies. The first method is based on the energy equation, reformulated in dimensionless terms to explicitly incorporate the influence of approach flow velocity—an essential factor in accurate flow estimation. The second method employs the kinetic factor, which characterizes the relative approach velocity head. Both analytical approaches converge to the same result, demonstrating that the discharge coefficient ( $C_d$ ) is governed exclusively by the compound dimensionless parameter  $\psi$  ( $\beta, M_1$ ), which is intrinsically linked to the section reduction ratio. The parameter  $\beta$ , referred to as the contraction rate, is defined as  $\beta = b_o/b$ , where  $b_o$  denotes the opening width of the device, and  $b$  represents the base width of the trapezoidal approach channel.

Link:

<https://larhyss.net/ojs/index.php/larhyss/article/view/16746>



## TITLE:

Optimization of Anthralin Microemulgel Targeted Delivery for Psoriasis and Acne

## AUTHOR :

Sakarkar S.; Jagdale S.; Dargude S.;  
Chabukswar A.; Urooj S.; Bilal A.; Mengash H.A.

## JOURNAL NAME:

Molecules (Vol-30, Issue-12)

## DETAILS:

Published on 17 June 2025



## ABSTRACT:

**Background:** Anthralin is known for its efficacy in treating psoriasis and acne, possessing poor solubility. Addressing these limitations, the present study endeavors to develop a microemulgel formulation of anthralin aimed at enhancing solubility. **Method:** The solubility study was performed in various solvents. An o/w (oil-in-water) emulsion was formed using the water titration method, which was optimized by statistical experimental design half-run CCD. The final optimized batch was evaluated for physicochemical and in vitro properties **Result:** The final optimized batch showed a particle size (PS) of 417 nm, -25.2 mV zeta potential (ZP) and pH 5.8, which remained stable upon centrifugation, heating-cooling and freeze-thawing cycle. Furthermore, microemulsion with Carbopol 943 5% w/v was selected as the gel base for the formation of microemulgel characterized by PS, ZP, pH, and viscosity of 230 nm, -50.6 mV, 6.9 and 14,200 cps, respectively, that ensured it a high enough stability. In silico molecular docking between ligand and protein provides the binding energies validating the interaction. Hence, the in silico study was performed for psoriasis and *P. acne* proteins. An in vitro antibacterial activity study on Propionibacterium revealed a significant efficiency of the formulation and MTT assay using L929 cell line in the presence of the drug-loaded microemulgel indicated an inhibition of growth proving that formulation has anti-psoriatic activity. **Conclusions:** Combination therapy with Clindamycin might improve efficacy while reducing antibiotic resistance risk

Link: <https://doi.org/10.3390/molecules30122629>





## TITLE:

Role of Artificial Intelligence in the Study of the Blue Economy and Marine Ecosystem: Use of AI in preservation of Marine EcoSystem

## AUTHOR :

Mukherjee S.; Wamane G.; Pundkar V.

## JOURNAL NAME:

Developing Smart Sustainability With Artificial Intelligence

## DETAILS:

Published on 2025



## ABSTRACT:

There is no universal definition of the term Blue Economy. However, the term is being widely used in the recent times in the context of climate change and environmental degradation. The rapidly increase in the plastic pollution and damage caused to the aquatic lives including coral reefs have now been a prominent cause of concern. Worldwide all the notable economies derive a good amount of revenue from the marine ecosystem. However, the increase in the environmental damage have impacted on the livelihoods of many individuals relying on the marine ecosystem for their survival. All the economies are looking into all possible forms of remedies to save the degradation caused to the blue economy. Artificial Intelligence (AI) is being gradually adopted by all the economies in the world for generation of clean energy, monitoring the data used for examining the marine ecosystem and minimizing the harm done through destructive fishing practices and detecting the damage from plastic pollution. The use of AI will help to minimize such activities by alerting the authorities in a timely manner.

Link: <https://www.igi-global.com/chapter/role-of-artificial-intelligence-in-the-study-of-the-blue-economy-and-marine-ecosystem/367616>



## TITLE:

Corrigendum to "Insights into medication-induced liver injury: Understanding and management strategies" [Toxicol. Rep. 14 (2025) 101976](S2214750025000940)(10.1016/j.toxrep.2025.101976)

## AUTHOR :

Tiwari V.; Shandily S.; Albert J.; Mishra V.; Dikkatwar M.; Singh R.; Sah S.K.; Chand S.

## JOURNAL NAME:

Toxicology Reports (Vol.-14)

## DETAILS:

Published on June 2025



## ABSTRACT:

Drug-induced liver injury (DILI) has increasingly become a major concern in Western countries since the late 1960s, with an estimated annual incidence of 13.9–19.1 cases per 100,000 people. DILI is a significant cause of acute liver failure, exhibiting a high mortality rate of 10–50 %. Its etiology includes medications, herbal products, and dietary supplements, exacerbated by pre-existing liver conditions, sonorities, pregnancy, and nutritional deficiencies. It is categorized into intrinsic and idiosyncratic reactions. Intrinsic DILI, dose-dependent and predictable, is primarily caused by substances like paracetamol, which leads to liver toxicity through direct metabolic pathways. In contrast, idiosyncratic DILI is less common, unpredictable, and affects susceptible individuals, with non-steroidal anti-inflammatory drugs, antibiotics, and cardiovascular agents frequently implicated in hospitals. Oxidative stress, mitochondrial dysfunction, bile salt export inhibition, and stress on the endoplasmic reticulum are some DILI-related pathophysiology. Diagnosis relies on biochemical tests, serological markers, radiological investigations, and liver biopsy. Management strategies emphasize the identification and cessation of the offending drugs, supportive care, and specific treatment options targeted to the culprit drugs. Management depends on the severity and nature of the injury.

Link: <https://doi.org/10.1016/j.toxrep.2025.102068>



## TITLE:

Indian Sign Language Detection in Virtual Reality  
using Leap Motion Controller

## AUTHOR :

Chunawale A.; Anant A.; Ahmed P.; Singh A.;  
Pokharkar P.; Sirsika S.

## JOURNAL NAME:

2025 International Conference on Emerging  
Smart Computing and Informatics, ESCI 2025

## DETAILS:

Published on 9 May 2025



## ABSTRACT:

Sign Language is a powerful tool that helps people with hearing and speech impairment to effectively communicate with normal people in real environment. Such people should also be able to communicate in virtual environments. The integration of Sign Language and Virtual Reality holds promise for breaking down communication barriers, empowering deaf individuals, and advancing accessibility and inclusion in virtual environments. It can enable them to fully participate in immersive environments. This paper focuses on the use of Leap Motion Controller and Virtual Reality devices for Indian Sign Language recognition, with the intention of increasing accessibility. Leap Motion Controller is used to capture Indian sign language gestures, that can be interpreted to text and thus providing people with a natural and expressive way to interact in Virtual Reality environments. The predicted alphabets and gestures are displayed in a Virtual Reality environment for visualization and better communication. EfficientNetB3, ResNet50 and Inception v3 are used for training the sign language data and prediction of correct gestures. Out of these models, EfficientNetB3 and Inception v3 achieved accuracies of 0.9984 and ResNet50 had an accuracy of 0.9987.

Link: <https://doi.org/10.1109/ESCI63694.2025.10988451>



## TITLE:

A novel methodology based on Contrast-Adaptive Threshold Model for accurate optic disc detection in retinal images of premature infants

## AUTHOR :

Kakade A.; Dhanaraj R.K.; Metkewar P.S.;  
Nayyar A.

## JOURNAL NAME:

Physical and Engineering Sciences in Medicine

## DETAILS:

Published on 3 June 2025



## ABSTRACT:

Identifying the exact location of the optic disc in retinal images is an important task while performing the retinal image analysis. Localization of the optic disc generally fails to detect its exact location due to unclear boundaries and low contrast images, especially in retinal images of infants where the process of retrieving the images should be very quick in low light conditions. The objective of this research paper is to detect the location of optic disc using a segmentation algorithm titled "Contrast-Adaptive Threshold Model" in infant retinal images. The novelty of this approach lies in its two-step strategy: it initially utilizes Adaptive Gamma Correction Color Preserving Framework for image enhancement, followed by the application of CATM. This approach performs the processing of red channel, in which the optic disc region is extracted from the red channel by eliminating non-optic disc pixel values. Furthermore, the method computes an adaptive threshold based on standard deviation of the Gaussian filter and enhanced red channel image ( IRE ), resulting in the precise localization of optic disc region. The results on ROP dataset of 1103 retina images achieved a dice score of 0.8285, accuracy of 0.9894, precision of 0.9958, recall of 0.9875, and specificity of 0.9999. The experimental evaluation of retinal image dataset of ROP infants, consisting of low-contrast, sub-optimal illumination, and false reflections, represents a significant improvement in optic disc localization, thereby contributing valuable support for the early and reliable diagnosis of ROP.

.Link: <https://doi.org/10.1007/s13246-025-01565-7>



## TITLE:

Network pharmacology and in-silico studies for molecular mechanisms of analgesic, anti-inflammatory and anti-arthritic effects of *Withania somnifera* (L.) Dunal phytoconstituents

1

## AUTHOR :

Tambe M.S.; Shinde S.R.; Baheti A.M.; Nagar S.; Pawar A.T.

## JOURNAL NAME:

Journal of Ayurveda and Integrative Medicine  
(Vol,-16, Issue-4)

## DETAILS:

Published on June 2025



## ABSTRACT:

**Background:** *Withania somnifera* (L.) Dunal, commonly known as ashwagandha, is an Ayurvedic herb belonging to the family Solanaceae.

**Objectives:** This study aims to explore the analgesic, anti-inflammatory and anti-arthritic potential of phytoconstituents of *Withania somnifera* (L.) Dunal (*W. somnifera*) by network pharmacology and in-silico docking studies.

**Methods:** Five major phytoconstituents, namely ashwagandhanolide, quercetin, withaferin A, withanone and withanolide A, were selected for the network pharmacology study. All five phytoconstituents were further evaluated for their binding properties using molecular docking (MD) and simulation tools. The compounds that exhibited significant binding affinities were further studied for pharmacokinetic and toxicity (ADMET) predictions.

**Results:** The network pharmacology study showed that out of the five selected constituents, withaferin A, withanolide A and quercetin can interact with various inflammation and pain-related genes. In in-silico studies, all five constituents were found to have significant interactions with inflammatory and nociception proteins cyclooxygenases, lipoxygenase, myeloperoxidase and cathepsin B. Further, ADMET studies predicted that all five phytoconstituents could not cross the blood-brain barrier but have high gastrointestinal absorption and bioavailability.

**Conclusion:** Ashwagandhanolide, quercetin, withaferin A, withanone, and withanolide A from *W. somnifera* may show the potential for analgesic, anti-inflammatory, and anti-arthritic activities. These findings provide a foundation for future in-vitro and in-vivo studies to confirm the therapeutic efficacy of these phytoconstituents from *W. somnifera*.

Link: <https://doi.org/10.1016/j.jaim.2024.101088>



## TITLE:

An Illumination Invariant Approach to Salient Object Detection in Hyperspectral Images

## AUTHOR :

Lone Z.A.; Pais A.R.; Krishna M.M.; Mhala N.C.

## JOURNAL NAME:

Proceedings of 8th International Conference on Inventive Computation Technologies, ICICT 2025

## DETAILS:

Published on 23 May 2025



## ABSTRACT:

Salient Object Detection (SOD) in Hyperspectral Images (HSI) has traditionally relied on low-level features, with limited exploration of high-level features. Low-level features lack semantic context, making them ineffective for detecting complex or subtle salient objects. Moreover, the inherent sensitivity of HSI to uneven illumination poses additional challenges, particularly when there is uneven illumination on the objects. To address these challenges, a novel SOD algorithm is proposed, that employs manifold ranking on high-level features learned through a deep segmentation network. Unlike existing methods that use raw HSI as input, the proposed approach utilizes spectral gradient as input, mitigating the effects of spectral variation. The learned features are ranked using a graph-based manifold ranking approach, which enhances the robustness of the detection process. Experimental evaluation on the HS-SOD dataset demonstrates that the proposed approach performs better, achieving superior results compared to state-of-the-art methods, with a precision of 0.63, an f1score of 0.51, and a Mean Absolute Error (MAE) of 0.08

Link: <https://doi.org/10.1109/ICICT64420.2025.11004850>



## TITLE:

AI-Enabled Crime Intelligence Extraction:  
Enhancing Law Enforcement Capabilities  
Through Deep and Dark Web Analysis and Data  
Correlation

## AUTHOR :

Kulkarn P.S.; Sarbhai K.; Gupta S.; Lobo N.;  
Parulekar A.; Firmin S.

## JOURNAL NAME:

Learning and Analytics in Intelligent Systems  
(Vol.-43)

## DETAILS:

Published on 16 May 2025



## ABSTRACT:

The emergence of anonymity services and the dark web presents a complex landscape where user privacy must be balanced with the need to combat illicit activities. To address this challenge, a Python-based dark web-watching crawler was developed using the Tor network to gather and store a large volume of dark website addresses. This system leverages the Scrapy framework for web crawling to extract specific crime-related information from dark websites, which is then stored in a MongoDB database for analysis. The crawler algorithms analyze the collected data to identify patterns of criminal behavior, and the results are visualized using word cloud diagrams and histograms to create an intuitive interface for real-time monitoring of dark web crimes. This monitoring system aims to enhance law enforcement's ability to detect and respond to illegal activities on the dark web, contributing to efforts to combat human trafficking, illegal information transactions, and the sale of drugs and firearms. The development of this system underscores the importance of leveraging technology to address the dual challenges of user privacy and criminal activity in anonymous online environments. Several machine learning models such as Naive Bayes, decision tree, logistic regression, random forest, KNN were tried for classifying the data from legitimate and dark net websites. Highest accuracy 99% was obtained with Random Forest algorithm.

Link: [http://dx.doi.org/10.1007/978-981-97-9855-1\\_32](http://dx.doi.org/10.1007/978-981-97-9855-1_32)



## TITLE:

Antidiabetic properties of Cucurbita pepo L. (pumpkin), Linum usitatissimum L. (flaxseed), and Avena sativa L. (oat): A review

## AUTHOR :

Pawase P.A.; Haldia S.; Bashir O.; Pathare A.M.; Shams R.; Dash K.K.; Ingale O.S.; Mukarram A.S.; Kovács B.

## JOURNAL NAME:

Journal of Agriculture and Food Research  
(Vol.22)

## DETAILS:

Published on August 2025



## ABSTRACT:

The present study explores the nutritional and functional aspects of Cucurbita pepo L. (pumpkin), Linum usitatissimum L. (flaxseed), and Avena sativa L. (oat), focusing on their in vitro and in-vivo hypoglycemic effects. A growing body of research highlights the role of natural foods in managing diabetes mellitus, owing to their ability to modulate blood glucose levels through insulin-secreting, insulin-sensitising, or insulin-mimetic mechanisms. These foods contain bioactive compounds that reduce blood glucose levels and enhance endogenous insulin production, positioning them as promising dietary interventions for diabetes management. Pumpkin, rich in polysaccharides, flavonoids, and trigonelline, has demonstrated hypoglycemic effects through its ability to stimulate pancreatic  $\beta$ -cell insulin secretion and exert insulin-mimetic properties. Studies suggest that pumpkin polysaccharides enhance glucose metabolism, contributing to insulin-secreting and insulin-mimetic functions. Flaxseed, a rich source of lignans,  $\alpha$ -linolenic acid, fiber, and polyphenols, primarily exhibits insulin-sensitising properties by enhancing insulin receptor function and reducing insulin resistance. Oats, due to their high  $\beta$ -glucan content, show both insulin-sensitising and insulin-mimetic properties.  $\beta$ -glucan, a soluble fiber, forms a viscous gel in the gastrointestinal tract, slowing glucose absorption and reducing postprandial glucose spikes. Furthermore, oats contain antioxidants like avenanthramides, which contribute to anti-inflammatory and glycemic control benefits. Overall, pumpkin, flaxseed, and oats exhibit notable hypoglycemic effects by enhancing insulin sensitivity, modulating glucose metabolism, and providing antioxidant benefits. While preclinical and clinical studies support their efficacy in regulating blood glucose levels, long-term human trials are necessary to establish their therapeutic potential and optimize their practical applications in diabetes management.

Link: <https://doi.org/10.1016/j.jafr.2025.102035>





## TITLE:

Promoting Equality Through CSR Practices:  
Legal Imperatives for Disability Rights and  
Inclusive Business Strategies for a Sustainable  
Society

## AUTHOR :

Ghose A.; Kochher H.S.; Ali S.M.A.

## JOURNAL NAME:

Corporate Social Responsibility in Health and  
Social Care

## DETAILS:

Published on November 2024



## ABSTRACT:

The complex relationship between human rights, corporate social responsibility (CSR), and global sustainability is explored in this chapter, with a particular emphasis on the intersection of disability rights and inclusive business practices. Examining both Indian domestic legislation and international agreements, the study finds that there are obstacles to enforcing policies that demand equal treatment and the elimination of bias against people with disabilities. A cornerstone of CSR, inclusive business practices are also examined, with an emphasis on the need for major changes to company policy and culture. In order to achieve genuine inclusion and fair job chances, it delves into holes in political theory, examines theories of capacities and social mobilization, and argues for a strategic strategy that aligns CSR with inclusive practices. In order to better understand disability rights, this chapter delves further into the existing domestic and international legal frameworks and makes the case for a more all-encompassing legal framework that is in line with CSR policies.

Link: <http://dx.doi.org/10.4018/979-8-3693-5991-4.ch012>





## TITLE:

Bibliometric Analysis of Omnichannel Retailing  
Trends: Insights from the Last 19 Years

## AUTHOR :

Rastogi R.; Saha S.

## JOURNAL NAME:

Indian Journal of Marketing (Vol.-55, Issue-5)

## DETAILS:

Published on May 2025



## ABSTRACT:

**Purpose :** This study investigated the evolution of scholarly research on omnichannel retailing, an area that still lacked a comprehensive bibliometric assessment. By synthesizing existing literature, the study aimed to highlight key research trends, influential works, and thematic developments in the field.

**Design/Methodology/Approach :** A bibliometric analysis was conducted on 279 publications indexed in the Scopus database from 2002 to 2021. VoSviewer software was used to create a visual map of recurring research terms. The study identified key articles, authors, and journals, while a content analysis of highly cited papers and recent works further refined the understanding of omnichannel retailing.

**Findings :** The results revealed the most influential contributions to the field, categorized into five major research clusters. The analysis highlighted key authors, sources, and documents that shaped omnichannel retailing literature. Content analysis further captured evolving research priorities and emerging themes from recent publications.

**Practical Implications :** The study consolidated fragmented literature, offering insights for researchers, practitioners, and retailers. Understanding dominant themes and research trajectories helped businesses implement effective omnichannel strategies while guiding future academic investigations.

**Originality :** This study uniquely combined bibliometric and content analysis to systematically map omni-channel retailing research. By providing a structured overview of existing studies, it enhanced theoretical comprehension and practical application of omnichannel strategies.

Link: <https://doi.org/10.17010/ijom/2025/v55/i5/175019>





## TITLE:

Beginning of March Towards Greener Future  
Through EV Charging Network

## AUTHOR :

Mali V.; Punnen R.J.

## JOURNAL NAME:

The Synergy of Sustainable Entrepreneurship

## DETAILS:

Published on November 2024



## ABSTRACT:

This case is based on real life setup of a Bengaluru based leading Electric Vehicles (EV) charging network company (pseudonym:E-mobility Solutions) and its strategic initiatives, analysis of financial feasibility of setting up the electric vehicles charging station, and the return on investment in Indian scenario. Electric vehicle charging stations are the backbone of EV ecosystem and depending on the situation and need, electric vehicles (EV) can be charged in a number of methods. Accordingly, charging infrastructure for EVs is of different forms and tailored for varied uses. The case study represents a major step towards the electric vehicle charging infrastructure and will broaden understanding of the presence and lack thereof a connection between the non-financial factor and their impact on profitability. The limitation, however, is that the study was confined to charging station in Bangalore district only. Future studies can also focus on setting up an EV Public Charging Station in a rural area and the return on investment from it.

Link: <http://dx.doi.org/10.4018/979-8-3693-4338-8.ch002>





## TITLE:

Integrating postnatal care into the redesign of group care beyond birth

## AUTHOR :

Gresh A.; Van Damme A.; Billings D.L.; Rising S.S.; Ibrahim S.; Ajibola A.; Chirwa E.; Don-Aki J.; Donoho N.; Hindori M.; Jiddawi N.; Kanebi E.; Kapito E.; Kay C.; Kinra T.; Molliqaj V.; Oyeledun B.; Rijnders M.E.B.; Wiseman O.; Yaqubi G.S.;

## JOURNAL NAME:

Archives of Public Health (Vol.-83, Issue-1)

## DETAILS:

Published on February 2025



## ABSTRACT:

**Background:** Globally, alarmingly high rates of maternal and infant mortality and morbidity persist. A constellation of health system and social factors contribute to this, including poor quality and barriers to accessing health care, including preventive services. As such, there have been calls for a redesign of maternal and child health (MCH) services. Although group care has primarily been tested in antenatal settings, it offers a promising redesign that optimizes maternal and child health care, survival, and well-being. The purpose of this study was to produce a blueprint of an adapted group care model that integrates postnatal maternal care, well-child care, and family engagement to be adapted to realities of different settings.

**Methods:** Using a human-centered design approach and the Framework for Reporting Adaptations and Modifications to Evidence-based interventions (FRAME), we employed qualitative methods to adapt CenteringParenting® (retaining its three core pillars of health assessment, interactive learning, and community building), and co-create the blueprint for group care beyond birth that can be used across settings. We conducted a rapid qualitative analysis to produce a blueprint.

**Results:** Participants collaboratively modified the content, format, and evaluation of CenteringParenting® with the goal of creating a blueprint that integrates postnatal and pediatric care into group care that can be further adapted and implemented across diverse settings and contexts.

**Conclusions:** The resulting group care beyond birth blueprint offers a strategy to redesign maternal and infant/child health services that can positively transform postnatal care and provide essential services to postpartum people. Adaptation of the blueprint to local realities is expected. Future research is recommended to test the model's acceptability, feasibility, and effectiveness across settings. Using this blueprint, we can build the evidence base to support this model aiming to improve maternal and infant/child health outcomes.

Link: <https://doi.org/10.1186/s13690-025-01508-4>



## TITLE:

Rapid and sensitive rGO/AuNP-based electrochemical nano-biosensor for detection of E. coli and S. aureus in less than an hour

## AUTHOR :

Sirdeshmukh V.V.; Joglekar S.S.; Joshi P.N.;  
Kale A.A.

## JOURNAL NAME:

AIP Advances (Vol.-15, Issue-5)

## DETAILS:

Published on May 2025



## ABSTRACT:

Improved diagnostic screening has become critical for bacterial infection identification and prevention. The sensitivity, reliability, repeatability, detection time, and specificity of a test or tool are critical for its translation to application. Electrochemical detection methods are quick and can provide point-of-care diagnosis. We report on reduced graphene oxide/gold (rGO–AuNP) nanocomposites that enabled highly sensitive and quick detection of harmful bacteria, such as E. coli and S. aureus. The technique involved employing rGO as a nano-carrier and Au as a bioactive surface to bind particular antibodies for electrochemical immunoassays. The current approach is culture-independent and does not require sample processing for bacterial detection. It is a pathogen detection technology that uses rGO–AuNP as an electrochemical transducer platform and target particular antibodies for E. coli and S. aureus to obtain improved sensitivity and speed. Differential pulse voltammetry was used to detect infections. These findings demonstrated that rGO–AuNP nanocomposites have up to three times the sensitivity of rGO and AuNP alone. Importantly, the antibody linked bioactive screen-printed electrodes remained stable for more than a month, allowing just electrochemical measurements to be performed at the time of detection. This allowed for pathogen detection in less than an hour. The limit of detection for both E. coli and S. aureus was 2 CFU/ml, making it extremely sensitive. An electrochemical sensor was showing a linear response with  $R^2$  0.98. According to the physicochemical evaluation of nanocomposites, the improved sensitivity and stability were caused by a lowered bandgap in composites and uniform distribution of AuNPs on a rGO nano-template.

Link:

[https://ui.adsabs.harvard.edu/link\\_gateway/2025AIPA...15e5236S/doi:10.1063/5.0243093](https://ui.adsabs.harvard.edu/link_gateway/2025AIPA...15e5236S/doi:10.1063/5.0243093)



## TITLE:

An Approach to Avoid Hypoglycemia: A Model for Mealtime Insulin Dose Calculation for Diabetic People

## AUTHOR :

Javale D.P.; Desai S.

## JOURNAL NAME:

U.Porto Journal of Engineering (Vol.-11, Issue-1)

## DETAILS:

Published on May 2025



## ABSTRACT:

Background: It has been observed that the number of diabetes patients has steadily increased over the past decades. Particularly, Type 1 diabetics are required to use insulin therapy to maintain their blood glucose levels. Technological advancements in the production of insulin pumps and monitoring devices have aided diabetics in maintaining a healthy lifestyle. A patient with type 1 Diabetes Mellitus (DM) requires insulin therapy with profound roots. Most diabetics require a minimum of two daily insulin injections, with dosage adjustments dependent on self-monitoring of blood glucose levels. Aim: However, it is frequently observed that determining insulin dose is a somewhat perplexing and not always appropriate task. When the incorrect insulin dose is administered, hypoglycemia, which is a blood glucose level below 60 mg/dL, frequently occurs. This condition places the patient at significant risk and should therefore not be ignored. Method: This paper proposes an FCCMID (Food Carbohydrate Count Mealtime Insulin Dose) model for calculating the Mealtime Insulin Dose (MID) based on insulin sensitivity, insulin carbohydrate ratio, and automatic calculation of carbohydrate count based on food intake using the Indian Food Carbohydrate Lookup Table. Conclusion: Target Blood Glucose Monitoring value attained by injecting MID (FCCMID) value of insulin is very close to the desired target Blood Glucose Monitoring Value (assumed to be 100 mg/l), thereby preventing Hypoglycemia. The observed average target blood glucose level is 110 mg/l, which is very near to the optimal 100 mg/l value.

Link: [https://doi.org/10.24840/2183-6493\\_0011-001\\_002275](https://doi.org/10.24840/2183-6493_0011-001_002275)





## TITLE:

Frugal Innovation in Entrepreneurship

## AUTHOR :

Manna R.; Singh A.

## JOURNAL NAME:

Frugal Innovation in Entrepreneurship

## DETAILS:

Published on April 2025



## ABSTRACT:

Understand modern data fabric and data mesh concepts using AI-based self-service data discovery and delivery capabilities, a range of intelligent data integration styles, and automated unified data governance—all designed to deliver "data as a product" within hybrid cloud landscapes. This book teaches you how to successfully deploy state-of-the-art data mesh solutions and gain a comprehensive overview on how a data fabric architecture uses artificial intelligence (AI) and machine learning (ML) for automated metadata management and self-service data discovery and consumption. You will learn how data fabric and data mesh relate to other concepts such as data DataOps, MLOps, AIDevOps, and more. Many examples are included to demonstrate how to modernize the consumption of data to enable a shopping-for-data (data as a product) experience. By the end of this book, you will understand the data fabric concept and architecture as it relates to themes such as automated unified data governance and compliance, enterprise information architecture, AI and hybrid cloud landscapes, and intelligent cataloging and metadata management.

Link: <https://www.igi-global.com/book/frugal-innovation-entrepreneurship/338266>



## TITLE:

Eco-bricks reinvented: transforming coal mine overburden and fly ash into sustainable building solutions

## AUTHOR :

Dhodare S.S.; Gogate N.; Dod R.

## JOURNAL NAME:

Innovative Infrastructure Solutions (Vol.-10, Issue-7)

## DETAILS:

Published on 18 June 2025



## ABSTRACT:

The escalating demand for construction materials coupled with the challenges of waste management has necessitated the development of sustainable alternatives. This study explores the potential of utilizing industrial by-products, namely coal mine overburden (OB) and fly ash (FA), for fabricating solid bricks compliant with IS: 12894 standards. Bricks were prepared with varying compositions of OB and FA, while keeping cement and sludge lime proportions constant. Physio-chemical analyses of the raw materials and manufactured bricks were conducted. The bricks were evaluated for compressive strength, water absorption, efflorescence, bulk density, and traces of heavy metals. The optimal composition—60 wt% fly ash, 20 wt% OB, 7 wt% cement, and 13 wt% sludge lime—achieved a compressive strength of 7.87 MPa. The study underscores the potential of these bricks for non-load bearing applications and highlights their contribution to sustainable waste management and economic circularity.

Link: <http://dx.doi.org/10.1007/s41062-025-02040-8>



## TITLE:

Impact of marble sludge powder on the mechanical properties of fiber-reinforced concrete: Experimental and ANN prediction

## AUTHOR :

Meena Devi G.; Shinde S.N.; Leo Amalraj J.; Isaac S.; Chouksey A.; Zunaithur Rahman D.

## JOURNAL NAME:

Computers and Concrete (Vol.-35, Issue-6)

## DETAILS:

Published on 6 June 2025



## ABSTRACT:

This research investigates the possible outcomes of partially replacing cement in concrete with marble sludge powder (MSP). Both freshly mixed concrete and concrete that had been given time to cure were used in studies to look at various fiber-reinforced (FR) concrete qualities. Two water-cement ratios, 0.35 and 0.40, were used to get the desired results. Marble sludge powder and 0.5% polypropylene 3S fiber were substituted at percentages of 0%, 5%, 10%, 15%, 20%, and 25%. To assess the samples' quality, a series of mechanical tests were conducted on them after 7, 14, 28, and 56 days of a cure. A split tensile and flexural strength prediction model was developed using an artificial neural network (ANN). Plotting the experimentally recorded split tensile and flexural strengths versus the statistical analysis of regression strength was done after 56 days for the artificial neural network. The results of the studies suggest that employing powder generated from leftover marble might have a positive economic impact and reduce the environmental harm that concrete causes. By substituting up to 15% of the typical aggregate with dry marble sludge powder, the split tensile and flexural strengths increased to 6.42 MPa and 7.98 MPa respectively.

Link: <https://www.techno-press.org/content/?page=article&journal=cac&volume=35&num=6&ordernum=7>





## TITLE:

IoT and AI-Driven Dynamic Traffic Signal Manipulation using V2I Communication for Advanced Urban Transportation

## AUTHOR :

Mantri S.; Randive S.; Maski K.; Dave N.;  
Maharaul D.

## JOURNAL NAME:

Proceedings of the International Conference on  
Intelligent Computing and Control Systems,  
ICICCS 2025

## DETAILS:

Published on 12 May 2025



## ABSTRACT:

Urban traffic congestion significantly impacts mobility, fuel efficiency, and emergency response times, necessitating intelligent and adaptive traffic management solutions. This paper proposes a Vehicle-to-Infrastructure (V2I) enabled dynamic traffic signal control system that leverages AI-driven Adaptive Control Logic (ACL) and Q-learning to optimize signal timings within geofenced intersections. The system employs Raspberry Pi-based edge controllers, GPS-integrated vehicular nodes, and MQTT protocol over LTE networks to ensure real-time, low-latency data exchange. Q-learning facilitates autonomous policy optimization by learning from historical traffic patterns, while ACL dynamically adjusts signal durations based on vehicle density and priority metrics. By integrating reward-based signal adjustments, the proposed system achieves efficient traffic flow regulation, emergency vehicle prioritization, and adaptive congestion mitigation. Simulation results demonstrate significant reductions in average vehicle wait times and enhanced network scalability, positioning this approach as a robust solution for next-generation smart transportation infrastructures.

Link: <https://doi.org/10.1109/ICICCS65191.2025.10984870>





## TITLE:

Advancements in Pedestrian and Vehicle Detection: A Comprehensive Review of Deep Learning Techniques

## AUTHOR :

Thakor P.; Dixit B.

## JOURNAL NAME:

2025 IEEE International Conference on Interdisciplinary Approaches in Technology and Management for Social Innovation, IATMSI 2025

## DETAILS:

Published on 9 May 2025



## ABSTRACT:

Detecting pedestrians and vehicles is a critical task in applications such as traffic management, surveillance, and autonomous driving. Recent advancements in deep learning, particularly Convolutional Neural Networks (CNNs), have significantly improved object detection, enabling revolutionary progress in the field. This paper reviews state-of-the-art techniques for pedestrian and vehicle detection, tracing their evolution from traditional feature-based approaches to advanced deep learning architectures such as YOLO, SSD, and R-CNN. Key datasets, including COCO, KITTI, and Cityscapes, are examined for their relevance in training and evaluating these models, alongside performance metrics like Mean Average Precision (mAP) and Intersection over Union (IoU). The paper identifies key challenges, such as detecting small and occluded objects, achieving real-time performance, and ensuring transferability across diverse domains. It emphasizes the importance of addressing scalability issues and deployment constraints, particularly for embedded systems and resource-limited environments. Emerging technologies, including attention mechanisms and transformer-based models, are explored for their potential to enhance detection capabilities. By integrating discussions on practical applications and real-world deployment, this paper bridges the gap between theoretical advancements and industry needs. It provides insights into future research directions, such as multi-modal data fusion and robust algorithms, to inspire innovation in pedestrian and vehicle detection systems.

Link: <https://doi.org/10.1109/IATMSI64286.2025.10985560>



### TITLE:

Block Chain Technology-Based Crypto-Go-Charity for Scholarship Donation Tracking Platform

### AUTHOR :

Jadhav S.; Mohite S.; Pise N.

### JOURNAL NAME:

Web Intelligence

### DETAILS:

Published on 13 April 2025



### ABSTRACT:

In the philanthropy sector, new technology is required to address issues like lack of transparency, trust, and accountability, as well as extended processing times and expenses. So, the present research examines the application of blockchain (BC) technology to enhance the donation tracking Platform, which delivers data immutability, and transaction transparency, as well as peer-to-peer transactions, as well as it is all the rage in today's technological period. BC enables the tracking of every donation, by permitting the donors to track the usage of their funds. The three primary roles of the present research are nongovernmental organization, Donors, as well as scholar beneficiaries. Corporate social responsibility (CSR) funds of industries are considered as donations, which causes educational scholarship for the initial prototype building. Subsequently, this prototype is scalable to every feasible field of educational scholarship as well as other methods of philanthropy. Thus, a Crypto-Go-Charity is proposed to solve the problems of the supply chain by utilizing the Ethereum BC and delivering a more secure and immutable ecosystem for scholarships. Solidity language is utilized here to write smart contracts and InterPlanetary File System for document storage. The performance is demonstrated by calculating the evaluation metrics as the privacy ratio and computational time for 200 users with the number of verifications at 300, as well as a key size of 50 kb, is 97.52% and 89.28 s, respectively. Likewise, the detection rate and memory usage of the system acquired the value of 98% and 81.46 MB for 200 users with the number of verifications at 300 as well as a key size of 50 kb.

Link: <https://doi.org/10.1177/24056456251320120>



## TITLE:

Carbon quantum dot embedded nematic liquid crystals for electro-optic application

## AUTHOR :

Sarnaik P.; Sutar A.; Jadhav Y.; Jadhav R.;  
Sartale S.D.; Kale B.B.; Kahane S.V.

## JOURNAL NAME:

Journal of Molecular Liquids (Vol.-433)

## DETAILS:

Published on 13 June 2025



## ABSTRACT:

This study explores the effect of organic quantum dots on the electro-optical properties of 5CB nematic liquid crystals (NLCs) at room temperature. Different concentrations of carbon quantum dots (CQDs) were used to modify the NLCs behaviour. Results showed improved molecular alignment and optical contrast, with 0.06 wt% CQDs achieving a 37 % enhancement in photoluminescence. This concentration also lowered the threshold voltage by 34 % and enhanced transmittance by a factor of 11. Additionally, the optimized sample displayed a 54 % increase in capacitance, suggesting reduced Frederick's transition. These findings highlight 0.06 wt% CQD-doped NLCs as ideal for display technology.

Link: <https://doi.org/10.1016/j.molliq.2025.127966>



## TITLE:

Review on sustainability in 3D concrete printing:  
focus on waste utilization and life cycle  
assessment

## AUTHOR :

Sakhare V.; Khairnar N.; Dahatonde U.;  
Mashalkar S.

## JOURNAL NAME:

Asian Journal of Civil Engineering

## DETAILS:

Published on 23 June 2025



## ABSTRACT:

Constructions using 3D printing are supposed to have potential benefits in sustainability, increased construction productivity, resource efficiency. Having spectacular benefits in the construction era, it announces many demanding challenges in the selection of appropriate material. When agro-industrial wastes are incorporated into concrete materials, 3D printing may also have significant benefits for sustainability. This paper's primary goal is to examine the sustainability aspects considered in delivering 3D printed structured mainly from raw precursors and life cycle assessment perspective. Initial data bases collected from search engines like google scholar, science direct was further scrutinized for selecting the papers. This study reviews mix composition used for printing 3D assembly using waste material like Granulated blast furnace slag, fly ash, silica fume etc. Effectiveness of the waste materials contributing to mechanical and fresh characteristics are explored. Industrial waste mostly be dumped found to have significant impact printability properties also contributing to sustainability aspects. Nonetheless, life cycle assessment (LCA) results are used to show how using wastes in 3D printing concrete materials affects environment in comparison to using traditional materials. Study deals with three pillars of sustainability i.e., Economical, environmental and sustainability. Outcome of the paper will help the researcher to optimally choose the waste precursors to deliver quality 3D printed structure with sustainable perspective.

Link: <http://dx.doi.org/10.1007/s42107-025-01408-6>





## TITLE:

A Decentralized Blockchain-Enabled Immutability Mechanism Integrated with Multimodal Biometric

## AUTHOR :

Kaur V.; Bhatt D.P.; Tharewal S.; Tiwari P.K.

## JOURNAL NAME:

2024 IEEE 11th Uttar Pradesh Section  
International Conference on Electrical,  
Electronics and Computer Engineering, UPCON  
2024

## DETAILS:

Published on 12 May 2025



## ABSTRACT:

With biometric authentication becoming more common, protecting personal and sensitive data is crucial in the digital age. This study examines how blockchain and multimodal biometric technologies might improve data security and authentication. Blockchain, which is decentralized, immutable, and transparent, may solve privacy, integrity, and security challenges in centralized biometric systems. Multimodal biometric systems, which use facial recognition, iris scans, and fingerprints, reduce errors and increase spoofing resistance. This paper examines blockchain and multimodal biometrics' operational principles and presents a decentralized biometric data security framework. Tampering, unauthorized access, and system failures are reduced by the suggested solution. The advantages of distributed blockchain-based architectures in data integrity, privacy, scalability, and cyberattack resilience are clear as compared to centralized biometric systems. This research shows how blockchain and multimodal biometrics can provide safe, immutable, and decentralized authentication for digital identity systems.

Link: <https://doi.org/10.1109/UPCON62832.2024.10982781>



## TITLE:

Sustainable Entrepreneurship in Emerging Economies (BRICS): Unveiling Opportunities Amid Challenges

## AUTHOR :

Srivastava S.P.; Srivastava S.; Varshney H.;  
Paigude S.

## JOURNAL NAME:

The Synergy of Sustainable Entrepreneurship

## DETAILS:

Published on 2025



## ABSTRACT:

Emerging economies often face challenges of suboptimal resource allocation, socioeconomic disparities, and deficiencies in healthcare and social welfare provisions. India's journey to become the third-largest start-up ecosystem globally clearly demonstrates how entrepreneurship has successfully tackled these difficulties. Nevertheless, using sustainable business concepts in entrepreneurial activities is crucial for sustainably addressing these challenges. Conventional business beliefs chase only profit motives, but sustainable entrepreneurship promotes a fundamental change in the belief that businesses may achieve financial gain while safeguarding the environment by focusing on people, profit, and the planet. This chapter has elucidated the significance of sustainable entrepreneurship in alleviating social and economic inadequacies in developing nations. Additionally, it explores the growing opportunities that arise from implementing circular economy and SDG objectives.

Link: <https://www.igi-global.com/chapter/sustainable-entrepreneurship-in-emerging-economies-brics/366940>





## TITLE:

The Emotional Rollercoaster of Market Overreaction: Understanding the Psychological Drivers of Irrational Market Behaviour

## AUTHOR :

Gupta S.K.; Nerlekar V.S.; Sane A.; Gadekar M.;  
Waghulkar S.

## JOURNAL NAME:

Psychological Drivers of Herding and Market Overreaction

## DETAILS:

Published on December 2024



## ABSTRACT:

Market overreactions, driven by psychological and cognitive factors, have significant economic consequences, impacting individual investors and broader financial systems. This chapter explores how emotions like fear, anxiety, greed, and euphoria contribute to market volatility, alongside cognitive biases such as confirmation and anchoring. It also examines herding behavior, the influence of authority figures, and the role of media in shaping market sentiment. Additionally, it considers neurological and physiological factors like stress and dopamine responses in investor behavior. Through case studies, the chapter illustrates these drivers' real-world impacts and offers strategies for mitigating emotional and cognitive biases. Emphasizing diversification, risk management, and regulatory measures, it provides insights for investors and policymakers to navigate and stabilize market overreactions.

Link: <http://dx.doi.org/10.4018/979-8-3693-7827-4.ch009>



## TITLE:

Fintech Adoption and Dispositional Innovativeness in E-Gold Investment: Evidence from India

## AUTHOR :

Pandey L.K.; Bhattacharjee J.; Singh R.; Baker H.K.; Sharma R.K.

## JOURNAL NAME:

Journal of Theoretical and Applied Electronic Commerce Research (Vol.-20, Issue-2)

## DETAILS:

Published on 16 May 2025



## ABSTRACT:

In the digital age, investing in e-gold is increasing in popularity. This study's objective is to assess the moderating role of dispositional innovativeness between fintech adoption and the intention to invest in e-gold, as well as to understand investors' behavioral intentions. This study uses the theory of planned behavior model to analyze the data. We prepared a structured questionnaire to collect data from Maharashtra, a state in India, and used PLS-SEM for analytical purposes. We also used focus group interviews to validate the findings from PLS-SEM. Our evidence shows that attitude, subjective norms, and perceived behavioral control significantly impact fintech adoption and the intention to invest in e-gold. This study also confirmed that dispositional innovativeness moderates the relationship between fintech adoption and the intention to invest in e-gold. This study implies that policymakers can redesign the regulation of digital assets to promote transparency, security, and faith in the fintech platform by recognizing the interest rate in e-gold.

Link: <http://dx.doi.org/10.3390/jtaer20020105>



## TITLE:

Implementation of Scrum Model for Virtual Learning in Mini Project Course During COVID-19

## AUTHOR :

Behl G.; Shahane D.; Mahajan K.

## JOURNAL NAME:

Communications in Computer and Information Science( Vol.- 2440 CCIS)

## DETAILS:

Published on May 2025



## ABSTRACT:

Since the outbreak of Coronavirus, the perspective of students, teachers, and parents towards education has changed significantly. The educational institutes across different continents have been forced to shift to online mode in COVID-19. All over the world, approximately 1.2 billion students' offline classrooms had been transformed into online classrooms using the virtual learning environment. The whole education model had changed dramatically and had introduced a new concept of virtual learning, whereby digital platforms had become the need of an hour for teaching and learning of today's education model. In a research study, it had been suggested that virtual learning has changed the scenario with increased accumulation of information, and an ever-lasting changing mode of operation. With this sudden shift away from the offline mode of the classroom, the education system has adopted a virtual learning platform. So, in the current situation, it had been observed that the lack of coordination among BCA students for developing their projects because no face-to-face communication was there between students and teachers, so as result it leads to poor quality projects and inadequate learning.

Link: [http://dx.doi.org/10.1007/978-3-031-88762-8\\_6](http://dx.doi.org/10.1007/978-3-031-88762-8_6)



## TITLE:

Artificial intelligence of blockchain in agriculture products quality and safety customers leadership

## AUTHOR :

Deepthi S.A.; Hirlekar V.; Kanade A.; Asha G.R.; Sengupta S.; Priya R.L.; Neeraja P.; Saravanan M.; Sriram S.

## JOURNAL NAME:

International Journal of Basic and Applied Sciences (Vol.-14, Issue-1)

## DETAILS:

Published on May 2025



## ABSTRACT:

Because digital technology enhances the effectiveness and transparency of supply chain operations while assisting in the exploration of the value of data in the chain. Digital technology can significantly increase the supply chain's efficiency for agricultural products. Beginning with a study of the road for digital technology to enable the supply chain for agricultural products, the paper then explores the internal mechanisms of digital technology that promote the development of the efficiency of the operation of the supply chain for agricultural products. Several issues in the supply chain for conventional agricultural products, including information asymmetry, uncomfortable communication, and disruptions in production and sales, can be resolved with the help of the research findings. A vital process that involves farmers, purchasers, suppliers, and several other parties is the supply chain. It is the foundation of the entire farming and agricultural system. The supply chain is time-consuming and faces multiple challenges. These days, the two most popular technologies are blockchain and artificial intelligence. The suggestion a blockchain ecosystem with AI capabilities for the agricultural supply chain. To illustrate the potential of the suggested model, a case study is provided. Artificial intelligence has completely changed the supply chain management process. AI is essential to the warehousing process because it helps with information collection, analysis, and inventory management, which helps businesses become more efficient and make more money. AI accurately forecasts demand, changes orders, and reroutes goods while they are in route. Big businesses like Google and Amazon have made significant investments in artificial intelligence. Industries like finance and agriculture have adopted blockchain for traceability, including insurance, natural state, and protecting private data. One such industry where blockchain is being widely used to improve and transform its many facets is agriculture.

Link: <http://dx.doi.org/10.14419/p43b3r21>



## TITLE:

Spanning edge-cyclability of augmented cubes

## AUTHOR :

Jagadale U.; Shinde A.; Malavadtakar P.

## JOURNAL NAME:

International Journal of Parallel, Emergent and Distributed Systems

## DETAILS:

Published on 27 May 2025



## ABSTRACT:

The spanning edge-cyclability is a generalization of hamiltonicity and pancyclicity of graphs. For a set  $F$  of  $r$  independent edges of  $G$ , if there exist  $r$  vertex-disjoint cycles that together span  $V(G)$  and each cycle contains exactly one edge of  $F$ , then  $G$  is called a spanning  $r$ -edge cyclable graph. In this paper, we study the spanning edge-cyclability of the  $n$ -dimensional augmented cube  $AQ_n$ , which is a hypercube generalization. We prove that  $AQ_n$  is spanning  $r$ -edge cyclable for  $1 \leq r \leq n-3$ , if the set  $F$  of  $r$  independent edges of  $AQ_n$  contains at least one complement edge.

Link: <https://doi.org/10.1080/17445760.2025.2508170>



### TITLE:

A computational analysis on the aerodynamic characteristics of slotted tangent ogive nose cones with forebodies at low subsonic velocity

### AUTHOR :

Raibole K.V.; Sonawwanay P.D.

### JOURNAL NAME:

International Journal of Sustainable Aviation  
(Vol.-11, Issue-2)

### DETAILS:

Published on 8 November 10 June 2025



### ABSTRACT:

The nose cones of aerospace vehicles act as the point of first contact with the on-coming flow of air. Consequently, evaluating and enhancing their properties becomes crucial for the overall performance of the vehicle. In this paper, the aerodynamic performance of slotted tangent ogive nose cones with a cylindrical afterbody has been assessed numerically for the Mach number of 0.1. The number of slots and the slot depth has been varied in order to investigate its effects on the lift and resulting side forces. The case of two symmetric slots on the nose cone, each of 0.001 m depth exhibited an enhancement in the lift-to-drag ratio at an angle of attack of  $15^\circ$ . The results also demonstrated the effectiveness of slots in controlling the generation of wake vortices. The case with four slots of 0.001 m depth each, vertically restricted the leeward vortices below the tip of the cylindrical forebody.

Link: <https://doi.org/10.1504/IJSA.2025.146652>



## TITLE:

Hybrid quantum inspired multi-objective optimization framework for self-healing concrete using AI-driven metaheuristics

## AUTHOR :

Karandikar A.; Zadgaonkar A.V.; Pawar R.; Gote A.C.; Patil T.R.; Islem H.F.

## JOURNAL NAME:

Asian Journal of Civil Engineering

## DETAILS:

Published on 7 June 2025



## ABSTRACT:

Designing a self-healing concrete that is going to be sustainable, self-sufficient in costs, and most importantly durable and strong throughout its desired lifecycle is the only solution to an ever-increasing complex set of infrastructure demands coupled with environmental constraints. These concrete mixture designs, involving complex, non-linear, multi-objective nature, often face optimization techniques of existing methods. Such traditional metaheuristics, though very useful, are not adaptable, slow in convergence, and not efficient in exploring large solution spaces under stringent performance constraints. This work presents a hybrid AI-quantum inspired multi-objective optimization framework for self-healing concrete design to deal with those challenges. The model integrates four developed computational techniques: (1) Quantum Inspired Differential Evolution with Adaptive Learning Mechanism (QIDE-ALM), improving exploration-exploitation balance using quantum bit-flipping and adaptive feedback; (2) Quantum-Accelerated Multi-Objective Particle Swarm Optimization (Q-MOPSO) that uses quantum tunneling to escape local optima and to speed up convergence; (3) Quantum-Driven Surrogate Modeling which uses quantum support vector machine and quantum neural network to reduce the computational burden on fast performance outcome prediction; and (4) Quantum Inspired Neural Networks for Multi-Objective Optimization (QINN-MO), dynamically learning complex relationships among mixture components by quantum Inspired weight modulation and architecture adaptations. Iterative implementation of this integrated model combines global searching with quick convergence and assessment, in conjunction with intelligent learning, generating Pareto-optimal concrete designs. The initial results show a tremendous improvement in performances: compressive strength of 50–55 MPa, healing efficiency in the range of 90–95%, and lifecycle cost reduction of up to 20%.

Link: <http://dx.doi.org/10.1007/s42107-025-01382-z>



## TITLE:

Comparative Impact of AI and Search Technologies on Outcome-Based Learning in Engineering Education

## AUTHOR :

Pawar M.; Dhotare V.; Urunkar N.;  
Andalgavkarkulkarni Y.; Shahane D.; Pawar A.S.

## JOURNAL NAME:

Journal of Engineering Education Transformations (Vol.-38, Special Issue 2)

## DETAILS:

Published on January 2025



## ABSTRACT:

AI and advanced search technologies are transforming engineering education by enhancing student outcomes, entrepreneurship, and employability through the development of tech-driven skills. This study employs outcome-based experimental learning to analyze the comparative impact of Generative AI (e.g., ChatGPT), non-generative AI tools, and traditional search engines (e.g., Google Search) on engineering education. Ninety students participated in a controlled experiment, solving a technical problem using these three methods. The study evaluated solution efficiency and learning outcomes based on a range of assessment criteria. Results revealed that Generative AI facilitated faster problem-solving but often led to weaker conceptual understanding, while non-generative AI tools provided more accurate solutions, albeit with slower response times. Google Search was effective for information retrieval but posed challenges in synthesizing coherent and integrated solutions. These findings underscore the importance of adopting a balanced approach that combines the strengths of AI tools with rigorous assessment methods to promote deep learning and critical thinking. The study highlights the relevance of evaluating evolving technologies in education and calls for curriculum and assessment strategies that adapt to these advancements. Future research should explore the long-term impact of AI on knowledge retention and its application across diverse engineering domains.

Link: <http://dx.doi.org/10.16920/jeet/2025/v38is2/25073>



## TITLE:

Smart Traffic Light Management System Using  
IoT and Deep Learning

## AUTHOR :

Rathod V.U.; Nandgoankar V.; Dhawas N.; Mali  
Y.K.; Chaudhari H.; Patil D.

## JOURNAL NAME:

Communications in Computer and Information  
Science (Vol.- 2439 CCIS)

## DETAILS:

Published on 21 May 2025



## ABSTRACT:

In modern urban areas, the management of traffic is a significant challenge, and efficient traffic flow is crucial to reduce congestion, travel time, and air pollution. Traditional traffic light systems are based on fixed schedules and do not consider real-time traffic conditions, leading to inefficient traffic flow and traffic congestion. The Smart Traffic Light Management System (STLMS) is a ground-breaking solution that makes use of cutting-edge technologies like the Internet of Things, Artificial Intelligence, and Machine Learning to optimize traffic flow and relieve congestion by using data on the amount of traffic on various road segments. To reduce the congestion and waiting time at the intersection, an algorithm is proposed to control the green light time of the traffic light based on the traffic density on different road segments. The result shows the proposed algorithm outperformed the other researches performed in this area.

Link: [https://link.springer.com/chapter/10.1007/978-3-031-88759-8\\_9](https://link.springer.com/chapter/10.1007/978-3-031-88759-8_9)



## TITLE:

Capsaicin: A review of its pharmacology in gastrointestinal health and disorders

## AUTHOR :

Sandu R.; Pandey V.

## JOURNAL NAME:

Pharmacological Research - Natural Products  
(Vol.-5)

## DETAILS:

Published on December 2024



## ABSTRACT:

Capsaicin is a naturally occurring alkaloid and since its discovery extensive research has shown evidence of its numerous therapeutic effects. Despite some health risks associated with capsaicin, its therapeutic properties are significant. This review aims to thoroughly evaluate the potential of capsaicin in treating gastric and duodenal ulcers, along with the molecular mechanisms underlying its effects, based on both in vitro and in vivo research documented in the literature. The review utilized databases such as PubMed, Web of Science, Science Direct, Wiley, ResearchGate, Google Scholar, and Scopus for the literature search. This study explores into the mechanisms by which capsaicin, via its interaction with the transient receptor potential vanilloid 1 (TRPV1) receptor, safeguards the gastric mucosa from ulceration. Research indicates that a dose of 2 mg/kg of capsaicin significantly enhances the repair and healing of gastric mucosal damage. Additionally, capsaicin helps prevent ethanol- and aspirin-induced gastric injury. In vitro studies have shown that capsaicin exhibits anti-H. pylori activity against metronidazole-resistant strains. Capsaicin is also recognized for its potent pain and itching relief properties. Capsaicinoids, which are known agonists of the TRPV1 receptor, show considerable promise. Exploring additional receptor pathways while maintaining gastric mucosal health may uncover further innovative therapeutic applications for capsaicin. In conclusion, capsaicin demonstrates notable gastroprotective and ulcer-healing effects through TRPV1 receptor mechanisms and could be a promising candidate for drug development aimed at treating various gastric ulcers.

Link: <https://doi.org/10.1016/j.prenap.2024.100103>





## TITLE:

Smart digital transformation: A sustainable path to achieving the SDGs and a green net zero economy

## AUTHOR :

Deshmukh R.; Jadhav B.R.; Jain V.

## JOURNAL NAME:

Digital Innovations for Renewable Energy and Conservation

## DETAILS:

Published on 2025



## ABSTRACT:

This study delves into the expansion of inclusive digital transformation and its impact on advancing the SDGs. It explores how digital technologies are being utilized to address key human needs such as access to clean water, sustainable food production, and the adoption of green energy. The study also examines how digitization can accelerate the adoption of environmentally friendly production methods and enhance public health through digital healthcare access, especially in underserved areas. This study aims to explore new technological advancements and digital strategies that can promote environmental consciousness and help achieve the Sustainable Development Goals. It draws upon an in-depth analysis of existing literature, desk research, and expert interviews. The report outlines strategies involving digital technology to advance specific SDGs. The study showcases digital solutions that demonstrate the efficacy of digital transformation and provides further insights into how data and digital technology can drive progress towards the SDGs.

Link: <https://www.igi-global.com/chapter/smart-digital-transformation/356984>



## TITLE:

Revolutionizing Supply Chains With AI and Machine Learning: Opportunities and Challenges

## AUTHOR :

Dankan G.V.; Reddy P.; Joshi D.; Jagtap M.M.;  
Hussana J.R.B.

## JOURNAL NAME:

AI and Machine Learning Applications in Supply  
Chains and Marketing

## DETAILS:

Published on October 2024



## ABSTRACT:

Supply chain management with AI and its enhancement, the ML, is witnessing vast change and opens up a brand-new vista of chances for improved effectiveness, precision, and creativity. The perspectives of implementing AI and actual cases of the companies with the use of ML are discussed in this chapter as the means of increasing the efficiency of functioning supply chains at different stages including demand forecasting, inventory management, logistics, and supply. In the presented case studies and descriptions of actual implementations of the discussed technologies, we underscore the pragmatic outcomes and competitive edge(es). In addition, the chapter also presented some catalyzes that may hinder the adoption of AI and ML including; Limited and poor quality of data, high cost of implementation and the need to employ qualified personnel in the area of AI and ML. We also touch on how the above barriers can be addressed and such technologies as AI and ML implemented in the supply chain.

Link: <http://dx.doi.org/10.4018/979-8-3693-6760-5.ch012>



## TITLE:

Advancements in Biogas Digester Materials: A Review of Strength, Durability, and Suitability

## AUTHOR :

Srivastava A.; Meena P.; Patane P.; Meena D.;  
Shelare S.; Wagle C.

## JOURNAL NAME:

Water Environment Research (Vol.-97, Issue-6)

## DETAILS:

Published on 23 June 2025



## ABSTRACT:

This paper explores the materials used to construct biogas digesters, essential for sustainable energy production. The study investigates various materials, such as thermoplastics like polyvinyl chloride (PVC), polyethylene (PE), and high-density polyethylene (HDPE), as well as traditional construction elements like masonry, stone, and concrete. It considers metals such as steel and composite materials, which all contribute to the efficacy and strength of biogas digesters. This review's primary goal is to compare these materials' properties, evaluate their structural and functional roles, and determine their suitability for various digester designs. Through a qualitative analysis of existing research, this study highlights innovative ways to integrate multiple materials to enhance biogas technology. Additionally, it looks at the efficiency of ferrous alloys, thermoplastics (PVC, PE, HDPE), cement, and stone digesters-all used to store gas. According to the findings, cement-based materials are the most common choice for small-scale home digesters because of their lifespan and resilience. On the other hand, the selection of materials for commercial or large-scale biogas facilities is contingent upon environmental factors and material attributes, such as thermal, electrical, and physical qualities. However, because plastic digesters are flexible, reusable, and chemical resistant, they are becoming a good substitute in areas where shipping and material availability are problems.

**SUMMARY:** This review's primary goal is to compare thermoplastics, traditional materials, metals, and composites for biogas digester durability and structural efficiency. Cement-based materials dominate small-scale domestic digesters due to resilience, longevity, and cost-effectiveness. Large-scale facilities prioritize material properties (thermal, electrical) and environmental factors for optimal design. Plastic digesters emerge as portable, chemical-resistant solutions in resource-limited regions with logistical challenges. Innovative material integration enhances biogas technology, balancing functionality and sustainability through qualitative research.

Link: <https://doi.org/10.1002/wer.70119>



## TITLE:

Effect of barium doping on dielectric and conducting properties of KHP crystals

## AUTHOR :

Gaonkar N.; Naik V.; Naik J.; Kumar R.M.;  
Vaidya R.G.

## JOURNAL NAME:

Journal of Materials Science: Materials in  
Electronics (Vol.-36, Issue-15)

## DETAILS:

Published on 27 May 2025



## ABSTRACT:

Barium doped and undoped Potassium Hydrogen Phthalate (KHP) crystals are grown by slow evaporation method under laboratory conditions. The XRD analysis confirmed the undoped and doped KHP crystallizes in orthorhombic structure with space group Pca21. The dielectric and conducting properties of 0.2 M% and 0.5 M% barium-doped KHP and undoped KHP crystals are studied. The dielectric constant found to decrease by 83.5 and 96.6% for 0.2 M and 0.5 M% barium-doped KHP crystals compared to undoped KHP, respectively. The ratio of dielectric constant of 0.2 M% barium doped to undoped KHP crystal is observed to be 0.09 at 10 kHz and 0.02 for 0.5 M% barium-doped KHP crystal. The doping of barium in KHP reduces the dielectric loss significantly. The frequency dependence of AC conductivity described by  $\sigma_{ac} \propto \omega^n$ , with the power  $n$  ranging between 0.499 and 0.163 for undoped and doped KHP crystals is observed. The inflexion point is found to be at 291.4 °C for undoped KHP, 290.3 °C for 0.2 M%-doped KHP and 290.9 °C for 0.5 M%-doped KHP crystals. The 0.5 M% barium-doped KHP crystal decomposes by 39.73% at the inflexion point which is slightly lesser compared to undoped (41.72%) and 0.2 M%-doped (40.83%) samples. Our studies show, the barium doping on KHP crystal can improve the performance and potentially influence dielectric properties. The investigations of barium doping on KHP crystals offers a pathway to dielectric and optical applications.

Link: <http://dx.doi.org/10.1007/s10854-025-14970-1>



## TITLE:

Corporate governance, CSR committee, sectoral spending and dividends

## AUTHOR :

Vinjamury R.S.

## JOURNAL NAME:

International Journal of Social Economics

## DETAILS:

Published on 27 May 2025



## ABSTRACT:

**Purpose** The study explores the relationship between corporate governance mechanisms, corporate social responsibility (CSR) spending and dividend payout decisions among firms in an emerging market (India). Specifically, it examines whether the sectoral choice of CSR spending and the decision-making framework, such as the constitution and size of a CSR committee, influence dividend payouts. **Design/methodology/approach** The study utilizes data from non-financial firms listed on the NSE 500 in India, covering the period from 2014 to 2020. The analysis focuses on CSR spending, sectoral allocations, and corporate governance variables, including the size of CSR committees. Models are employed to assess the impact of these factors on the likelihood of a firm paying dividends. **Findings** The study finds that CSR spending, particularly sector-wise investments, influences dividend payout decisions. Firms spending on environmental causes are more likely to pay dividends. The size of the CSR committee does not significantly impact dividend decisions. Additionally, corporate governance factors, such as the independence of the board, audit committee and the number of board meetings, play a crucial role in determining dividend payouts. **Originality/value** This study contributes to the existing literature by focusing on the interplay between sector-wise CSR spending, corporate governance mechanisms and dividend decisions within the context of an emerging economy like India where CSR activities are mandated by law. Findings of the study indicate that stakeholders focusing on CSR spending should not limit their analysis to just aggregate CSR spending, but should also consider sector-wise spending.

Link: <https://doi.org/10.1108/IJSE-09-2024-0794>





## TITLE:

A COMPREHENSIVE REVIEW ON THE  
PERFORMANCE AND STABILITY OF  
NANOFLUIDS IN PLATE HEAT EXCHANGERS

## AUTHOR :

Mishra A.; Chakrabarti S.S.; Sahur M.K.

## JOURNAL NAME:

Interfacial Phenomena and Heat Transfer (Vol.-  
13, Issue-3)

## DETAILS:

Published on March 2024



## ABSTRACT:

In the last two decades, there has been a significant focus on improving the efficiency of heat exchangers by using nanofluids. Nanofluids have superior thermal conductivity and slightly increased specific heat. This review encompasses the studies conducted on improvements in the heat transfer efficiency of plate heat exchangers (PHE) for various nanoparticles (metallic, metal oxides, nonmetallic, hybrid) by different methods (experimental, empirical, and numerical analysis). Nanofluids have been found to have marginally increased viscosity and density and can cause little increase in pumping power. This review includes studies on increased power consumption in using nanofluids in PHE. Though nanoparticles are ultrafine particles, sedimentation and coagulation may affect the heat transfer after prolonged usage. This review includes studies conducted on sedimentation and coagulation of nanoparticles in PHE. Nanofluids may become unstable after continuous use, so this review explores the findings on the stability of nanofluids and various methods of increasing the stability of nanofluids, such as sonication and surfactants in PHE. This review also covers studies of nanofluids using artificial intelligence (AI) and machine learning (ML). By this review, it has been found that nanofluids undoubtedly increase heat transfer efficiency. However, the effects of coagulation, sedimentation, and stability over long-term use cannot be completely ruled out. Hence more comprehensive research is needed to assess the stability of nanofluids for prolonged use. Future research using AI and ML can help in developing commercially economical models that can work for a substantial period.

Link:

<https://doi.org/10.1615/interfacphenomheattransfer.2025055764>



## TITLE:

Expectations and propensity of Gen Z to spend additional for eco-friendly green products: Lessons for marketers

## AUTHOR :

Deshmukh R.; Pasumarti S.S.

## JOURNAL NAME:

Green Marketing Perspectives: Effective Messaging for Sustainable Practices

## DETAILS:

Published on 29 April 2025



## ABSTRACT:

Digital natives, Generation Z youth appreciate wealth far more than their predecessors and, as a result, are mindful of how they spend their money. They also have an intense understanding of justice, equality, and environmental awareness. The sustainability targets set on societies can be attained in part using products that are more sustainable. The research investigates the factors that influence the appetite for environmentally friendly goods among Generation Z adolescents and their inclination to cover a higher price for the same. A study with 300 Indian users of green products was used to conduct a quantitative analysis.

A statistical evaluation that was descriptive in nature was done first. After that, the Partial Least Square technique was used to investigate the linkage among the factors that influence consumers' desire for green products along with their readiness to shell out a premium for them. Therefore, concerns about the environment, forecasts of the years to come of the environment, and perceived level of the environment all positively impact Gen Z's propensity to spend more for green products that are sustainable. The impact is put forth by green perceived benefits. The first proof of the way younger Indian Gen Z clients' perceptions with respect to quality, benefits, as well as future green vision can affect their disposition to spend extra for green products is provided by this study about ecological problems. Furthermore, it illustrates the potential of using green products as indicators.

Link:

<http://dx.doi.org/10.1108/978-1-83608-772-420251015>





## TITLE:

Medical diagnosis from health records using  
Natural Language Processing (NLP) with  
integration of Explainable Artificial Intelligence  
(XAI)

## AUTHOR :

Rao M.; Kumar K.V.; Apune S.; Gutte V.S.

## JOURNAL NAME:

AI Technologies and Advancements for  
Psychological Well-Being and Healthcare

## DETAILS:

Published on September 2024



## ABSTRACT:

The transition to digital health records in recent years has opened up numerous opportunities to utilize advanced technologies for enhancing patient care and medical. Within the dynamic landscape of healthcare, the digitalization of health records has become a pivotal catalyst for innovation. It presents many opportunities to harness data-driven methodologies for refining medical diagnosis. At the forefront of these methodologies lies the integration of Natural Language Processing (NLP) with Explainable Artificial Intelligence (XAI), offering a transformative approach to extract invaluable insights from the huge reservoirs of information embedded within Electronic Health Records (EHRs). This convergence of advanced techniques holds the potential to reshape diagnostic practices, equipping healthcare professionals with actionable intelligence derived from comprehensive analysis of patient data. Health records encapsulate a rich narrative, detailing intricate aspects of patient symptoms, medical histories, treatment trajectories, and diagnostic outcomes. Yet, this wealth of information often remains dormant within unstructured textual data, posing a significant challenge for effective analysis and comprehension. Natural Language Processing (NLP) emerges as a beacon of hope, providing sophisticated algorithms capable of deciphering these clinical narratives, extracting relevant insights, and facilitating automated decision support.

Link: <http://dx.doi.org/10.4018/979-8-3693-9158-7.ch011>





## TITLE:

Grid Search and LLM Assisted Hybrid Approach  
for Hyperparameter Optimization

## AUTHOR :

Kalele N.; Kalyani V.K.

## JOURNAL NAME:

2025 IEEE International Conference on  
Interdisciplinary Approaches in Technology and  
Management for Social Innovation, IATMSI 2025

## DETAILS:

Published on 9 May 2025



## ABSTRACT:

AI has become one of the technological stepping stones in most industry verticals including BFSI. The use of AI for tasks like credit risk assessment, fraud detection, and customized client experiences has become a norm in BFSI space. However, developing AI/ML based decision systems for such applications involves spectrum of tasks such as data gathering and analysis, feature selection, tuning models via hyperparameter optimization and finally testing and deployment. In this paper, we explore hyperparameter optimization with feature analysis for credit risk assessment application in the BFSI industry. Typically, GridSearchCV and Bayesian Optimization are widely acceptable and reliable methods for hyperparameter optimization. Recently, it was proposed that LLMs can be used for optimization problems. Here, we look at a hybrid approach with the structured search capabilities of GridSearchCV in tandem with the optimization strength of LLMs. In the proposed approach, we perform the coarse-grain grid search and use the collected data as input for the LLM. Based on these data, we further prompt LLM to analyze and draw and propose a finer search space. Sampling from this finer search space results in more efficient and accurate optimization. This shows the effectiveness of LLMs to refine the search. Further, we explore feature analysis methods like SHAP values, correlation, significance distribution, etc. and identify important features that are helpful in better modeling and decision explanations.

Link: <https://doi.org/10.1109/IATMSI64286.2025.10985615>



## TITLE:

Performance evaluation predictive modeling of  
cement mortar durability with dimensional  
limestone waste

## AUTHOR :

Chauhan H.S.; Sharma K.V.; Gautam P.K.

## JOURNAL NAME:

Journal of Building Pathology and Rehabilitation  
(Vol.-10, Issue-2)

## DETAILS:

Published on June 2025



## ABSTRACT:

This study investigates the durability and performance of cement mortar incorporating dimensional limestone crushed sand (DLCS) and dimensional limestone slurry (DLS) waste as a partial replacement for river sand. Fourteen mortar mixes with DLS and DLCS replacements of 20%, 30%, and 40% were evaluated for resistance to environmental conditions, including acid attack, sulfate attack, chloride ion penetration, and carbonation. Multiple Linear Regression (MLR), Random Forest Regression (RF), Support Vector Regression (SVR), and Artificial Neural Networks (ANNs) were used to predict the long-term durability of the mortar mixes. ANNs, a machine learning approach that mimics neural structures to model complex relationships in data, achieved the highest prediction accuracy, with R<sup>2</sup> values exceeding 0.90 across all degradation mechanisms. Feature importance analysis indicated that DLS/DLCS replacement percentage and exposure duration were the most influential factors affecting durability. Results revealed that mixes with 20–30% replacement exhibited superior performance in reducing strength loss and permeability while enhancing microstructural integrity. This study provides critical insights into optimizing cementitious materials for enhanced durability in environmentally challenging conditions.

.Link: <http://dx.doi.org/10.1007/s41024-025-00645-1>





## TITLE:

Damaging effects of cold-shoulder at work: a sequential explanatory mixed method approach

## AUTHOR :

Singh L.B.; Dhir S.; Srivastava S.

## JOURNAL NAME:

Knowledge Management Research and Practice

## DETAILS:

Published on 23 June 2025



## ABSTRACT:

Grounded in the theory of conservation of resources, this study investigates the role that organizational cynicism plays in linking workplace ostracism to both the creation and hoarding of knowledge. This research delves further into the possible moderating effect of ethical leadership on the association between organizational cynicism and knowledge creation and hoarding. The study used a mixed-method approach, including a quantitative method in Study 1 and a qualitative method in Study 2. The primary data were collected from 284 respondents and in-depth interviews with 11 respondents from the hospitality and tourism industry was analysed. The study's results suggest that workplace ostracism significantly contributes to organizational cynicism, which partially mediates the link between workplace ostracism and knowledge hoarding. The outcomes of this study provide additional evidence to substantiate the proposition that the presence of ethical leadership within a workplace moderates the link between organizational cynicism and knowledge creation. This study fills a meaningful research gap in the post-COVID-19 era, substantially improving our comprehension of knowledge dynamics within the hospitality and tourism industry, which faces a talent shortfall due to no show by the old employees and hesitation among the new talent to join the industry because of uncertainty and low salary packages associated with it.

Link: <https://doi.org/10.1080/14778238.2025.2519287>



## TITLE:

Plasma-Assisted Synthesis of Carbon Nanotubes from Naturally Occurring Catalysts in Floral Biomass for Ultrafast Lithium/Sodium-Ion Batteries

## AUTHOR :

Misal P.S.; Raut S.A.; Chothe U.P.; Kalubarme R.S.; Mathe V.L.; Thiry D.; Kulkarni M.V.; Chaudhari S.R.; Kale B.B.

## JOURNAL NAME:

Batteries and Supercaps

## DETAILS:

Published on 20 May 2025



## ABSTRACT:

This study highlights the synthesis of open-ended carbon nanotubes (CNTs) and disordered amorphous carbon using a plasma-based approach. The unique combination of open-ended CNTs and disordered carbon contributes to exceptional anode performance for lithium-ion (LIB) and sodium-ion batteries (SIB). Field-emission scanning electron microscopy images confirm the presence of CNTs intertwined with porous carbon, while transmission electron microscopy analysis reveals CNTs with an average diameter of 85 nm. The selected area electron diffraction pattern indicates an interlayer D-spacing of 0.35 nm, characteristic of disordered carbon. As an anode for LIBs, the material delivers an initial capacity of 394 mAh/g at 0.05 A/g and maintains 233 mAh/g after 3000 cycles at 1.5 A/g. Meanwhile, for SIB, it is assessed at a high current rate of 0.5 A/g, where it exhibits that the specific capacity remains steady at around 75 mAh/g over 5000 cycles. The synergistic structure of CNTs and disordered carbon enhances ion transport and provides abundant active sites for Na<sup>+</sup> and Li<sup>+</sup> intercalation. The increased interlayer spacing, porous morphology, and interconnected structure reduce ion diffusion resistance, enabling superior rate performance. The sustainable plasma synthesis method, combined with high capacity, long cycle life, and versatility in LIBs and SIBs, makes it a promising candidate for next-generation energy storage.

Link: <https://doi.org/10.1002/batt.202500203>



## TITLE:

Role of social media marketing in food industry

## AUTHOR :

Kulkarni S.

## JOURNAL NAME:

Technological Innovations in the Food Service Industry

## DETAILS:

Published on 2025



## ABSTRACT:

Social media has emerged as a pivotal force inside the food enterprise, basically reworking how manufacturers engage with clients, marketplace merchandise, and power sales. It explores the crucial function of social media advertising in the food enterprise, highlighting its capacity to influence consumer conduct, foster logo loyalty, and facilitate the discovery of recent products and dining reviews. Thru structures like Instagram, TikTok, and facebook, meals brands can connect to a worldwide target market, leveraging visually attractive content, influencer partnerships, and focused marketing to reach and engage clients. The integration of e- trade and food shipping services within these systems in addition streamlines the consumer journey, bearing in mind seamless transitions from discovery to purchase. Additionally, the chapter delves into emerging developments together using AI and data analytics for personalized marketing, and the significance of user-generated content material.

Link: <https://doi.org/10.4018/979-8-3693-7683-6.ch007>





## TITLE:

Examining alleged corruption in accreditation:  
causes and preventive measures

## AUTHOR :

Kumar A.; Gawande A.; Sane A.; Kale S.;  
Paliwal J.; Agarwal A.; Brar V.; Dixit N.; Saini A.;  
Raibagkar S.

## JOURNAL NAME:

Quality Assurance in Education

## DETAILS:

Published on June 2025



## ABSTRACT:

**Purpose** This study aims to examine alleged corruption in the accreditation process based on international academic literature and recent investigative reports and also examines measures to improve its integrity. It is a novel attempt to address a major research gap in accreditation. **Design/methodology/approach** A quantitative method, a t - test, was used to test two hypotheses related to the causes of the alleged corruption in accreditation and preventive measures. Purposive sampling was used to draw a sample of 395 from a population of 7,266 colleges and universities accredited by the National Assessment and Accreditation Council of India. **Findings** The study's key findings are that there are multiple causes of alleged corruption in accreditation. It also endorses the measures suggested by Dr. K Radhakrishnan's committee (an expert committee appointed by the Indian Ministry of Education) to improve accreditation integrity to an extent. **Originality/value** The study's unique contribution is that it is among very few studies investigating corruption in accreditation. While sizable international literature looks at accreditation as a measure to curb academic corruption, very few studies have addressed corruption in accreditation.

Link: <http://dx.doi.org/10.1108/QAE-04-2025-0099>



## TITLE:

Adaptive Slotframe Allocation with QoS and Energy Optimization in 6TiSCH for Industrial IoT Applications

## AUTHOR :

Pradhan N.; Chaudhari B.S.; Khandekar P.D.

## JOURNAL NAME:

Telecom (Vol.-6, Issue-2)

## DETAILS:

Published on 10 June 2025



## ABSTRACT:

Industry 4.0 has transformed manufacturing and automation by integrating cyber-physical systems with the Industrial Internet of Things (IIoT) for real-time monitoring, intelligent control, and data-driven decision making. The IIoT increasingly relies on IEEE 802.15.4e Time-Slotted Channel Hopping (TSCH) to achieve reliable, low-latency, and energy-efficient industrial communications. The 6TiSCH protocol stack integrates scheduling and routing to optimize transmissions for resource-constrained devices, enhancing Quality of Service (QoS) in IIoT deployments. This paper proposes an innovative adaptive and cross-layer slotframe allocation technique for 6TiSCH networks, dynamically scheduling cells based on node hop distance, queue backlog, predicted traffic load, and link quality metrics. By dynamically adapting to these parameters, the proposed method significantly improves key QoS metrics, including end-to-end latency, packet delivery ratio, and network lifetime. The mechanism integrates real-time queue backlog monitoring, link performance analysis, and energy harvesting awareness to optimize cell scheduling decisions proactively. The results demonstrate that the proposed strategy reduces end-to-end latency by up to 32%, enhances PDR by up to 27%, and extends network lifetime by up to 10% compared to state-of-the-art adaptive scheduling solutions.

Link: <https://doi.org/10.3390/telecom6020041>





## TITLE:

NEP Policy Implementation Strategies in  
Education in India

## AUTHOR :

Vaithianathan V.; Shastri D.S.; Nandakumar V.;  
Misba M.; Kumar P.S.V.V.S.R.; Boopathi S.

## JOURNAL NAME:

Educational Philosophy and Sociological  
Foundation of Education

## DETAILS:

Published on September 2024



## ABSTRACT:

India's National Education Policy 2020 seeks to provide education that is inclusive and interdisciplinary. It entails updating curricula, educating teachers, utilizing technology, and changing assessment procedures. In this chapter, the main elements of NEP 2020, such as vocational education, basic literacy, and ECCE, as well as possibilities and obstacles, have been discussed for implementation. It also illustrates successful tactics using case studies and real-world situations. The strong emphasis on the value of stakeholder engagement in promoting successful policy implementation and guaranteeing ongoing monitoring and assessment is also explored. The involvement of stakeholders (educators, administrators, lawmakers, and the community) has been discussed. The achievable methods for incorporating NEP 2020 into the Indian educational system are discussed with the goal of motivating establishments and advancing students' overall development

Link: <http://dx.doi.org/10.4018/979-8-3693-3587-1.ch013>



## TITLE:

Air pollution prediction with advanced preprocessing and deep ensemble learning

## AUTHOR :

Narkhede G.; Poonawala M.; Sonawane A.;  
Hiwale A.; Singh A.R.

## JOURNAL NAME:

Atmospheric Pollution Research (Vol.-16, Issue-10)

## DETAILS:

Published on June 2025



## ABSTRACT:

The research presented investigates the impact of model selection and preprocessing techniques on air pollution prediction performance, particularly pertaining to achieving Sustainable Development Goals (SDGs). Accurate training of predictive models necessitates effective handling of missing or null values in environmental datasets. To address this challenge, Probabilistic Principal Component Analysis (PPCA) and the Extra Tree Regressor for data imputation are employed, followed by scaling using Robust Scaler, Min-Max Scaler, and Standard Scaler. A thorough comparison of these preprocessing methods revealed that PPCA is the most suitable choice for imputing missing values in air quality datasets, while the Robust Scaler provided the most reliable and accurate scaling. Additionally, Stochastic Gradient Descent (SGD) is integrated as an optimization technique to enhance model performance. The Weighted Average ensemble method, combining PPCA imputation and Robust Scaler, demonstrated superior predictive capabilities. This research highlights the potential for further improvements through additional ensemble techniques and model optimization strategies, opening avenues for future research focused on improving prediction precision and advancing the achievement of Sustainable Development Goals linked to environmental sustainability.

Link: <https://doi.org/10.1016/j.apr.2025.102610>



## TITLE:

Building AI-Driven Frameworks for Real-Time  
Threat Detection and Mitigation in IoT Networks

## AUTHOR :

Joshi M.; Tiwari A.; Dhabliya D.; Lavate S.H.;  
Ajani S.N.; Gandhi Y.

## JOURNAL NAME:

2025 International Conference on Emerging  
Smart Computing and Informatics, ESCI 2025

## DETAILS:

Published on 9 May 2025



## ABSTRACT:

The fast growth of Internet of Things (IoT) networks has made security risks more complicated and numerous. To find and stop these threats in real time, we need new and creative solutions. This article talks about an AI-powered system that can make IoT networks safer by finding and stopping threats as they happen. The system uses both machine learning (ML) and deep learning (DL) to look at real-time data from IoT devices and find strange patterns that could be signs of an attack. This is done by using advanced algorithms, like decision trees, neural networks, and reinforcement learning, to learn new things all the time and adjust to new dangers. To improve the efficiency of identification and cut down on false positives, a mixed method is used that combines controlled and unstructured learning. The system also has an automatic mitigating procedure that separates infected devices and stops them from doing more damage when risks are found. Compared to standard security methods, our results show that the proposed structure makes danger identification and prevention much more effective in IoT networks. The system is very good at finding different kinds of threats, like DDoS, malware, and illegal access, and it does this while using very little computing power. This means it can be used in IoT settings with limited resources. This study provides a flexible and scalable way to protect the IoT environment, which is becoming more and more linked.

Link: <https://doi.org/10.1109/ESCI63694.2025.10988310>





## TITLE:

Advancing Drone-Based Traffic Surveillance: A Review and Novel Framework for Attention-Guided Motion Deblurring and Compensation

## AUTHOR :

Sapkal R.J.; Warhade K.K.

## JOURNAL NAME:

2025 International Conference on Emerging Smart Computing and Informatics, ESCI 2025

## DETAILS:

Published on 9 May 2025



## ABSTRACT:

This paper investigates the critical challenges of motion deblurring and compensation in drone-based traffic surveillance, focusing on the transformative potential of Attention-Guided Deblurring Transformer (AGDT). The framework employs self-attention mechanisms to address non-uniform blur and integrates hybrid motion compensation techniques for stabilizing dynamic video feeds. Quantitative evaluation using metrics such as PSNR, SSIM, and MOTA demonstrates AGDT's remarkable ability to enhance video clarity, ensure smooth frame transitions, and improve multi-object tracking accuracy under real-time constraints. The study also provides a comparative analysis of state-of-the-art methods, highlighting AGDT's superior performance while identifying areas for future optimization.

Link: <https://doi.org/10.1109/ESCI63694.2025.10988171>



## TITLE:

In-Situ Growth of SnS<sub>2</sub> Hexagonal Nanoplates on 2D Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub>: An Efficient Nanoheterostructure for Hydrogen Generation and Dye Degradation

## AUTHOR :

Tambe A.B.; Jawale N.S.; Arbuji S.S.; Umarji G.G.; Kadari R.; Kulkarni S.; Kale B.B.

## JOURNAL NAME:

Langmuir

## DETAILS:

Published on 19 June 2025



## ABSTRACT:

The present investigation demonstrates the successful in situ synthesis of 2D Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub>/SnS<sub>2</sub> nanoheterostructures with varying Ti/Sn ratios, which were then evaluated as photocatalysts for hydrogen production via water splitting. Several characterization techniques were employed to confirm the formation and properties of the nanoheterostructures. XRD analysis revealed diffraction peaks corresponding to Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub> (MXene) and SnS<sub>2</sub>, confirming the successful synthesis of Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub>/SnS<sub>2</sub> nanoheterostructures. FE-SEM, FETEM, and XPS further validated the formation of 2D nanoheterostructures, showing hexagonal nanosheets of SnS<sub>2</sub> and layered structures of MXene. High-resolution TEM images and selected area electron diffraction patterns indicated the coexistence of Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub> and SnS<sub>2</sub> in the heterostructures. The optical properties of the nanoheterostructures showed absorption in the visible light region, with band gaps in the range of 2.17–2.34 eV. Photoluminescence (PL) spectra exhibited band-edge emission in the range of 535–550 nm for all compositions, except for the pristine Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub>. The TS-5 wt % nanoheterostructure exhibited the highest photocatalytic hydrogen generation of approximately 1178.5  $\mu\text{mol}/0.1\text{ g}$ , significantly outperforming other compositions. It also demonstrated an excellent apparent quantum yield of 2.2% and efficient methylene blue (MB) dye degradation. The study highlights that the longer decay times of photogenerated charge carriers in the TS-5 wt % sample contribute to its superior photocatalytic performance. These findings suggest that the design of 2D nanoheterostructures with optimized composition can significantly improve photocatalytic efficiency.

Link: <https://doi.org/10.1021/acs.langmuir.5c00719>





## TITLE:

Leveraging Convolutional Neural Networks for AI  
Artwork Classification

## AUTHOR :

Ohal H.S.; Balote T.S.; Joshi M.H.; Suryawanshi  
H.C.; Suryawanshi N.V.

## JOURNAL NAME:

2025 International Conference on Emerging  
Smart Computing and Informatics, ESCI 2025

## DETAILS:

Published on 9 May 2025



## ABSTRACT:

The emergence of AI-made art is pioneering in the creative landscape, yet it challenges quality and authenticity across many image-generation platforms. This paper aims to develop a new AI art detector capable of checking the authenticity of artwork. The developed detector will be designed in such a way that it can evaluate essential factors regarding originality, coherence, and aesthetic appeal. This is achieved by using deep learning techniques through training over a wide variety of datasets, from those generated by AIs and humans within the context of artwork. This process will automatically identify markers that are unique to content generated by AIs. With this, the findings will provide insights into the strengths and limitations of existing AI art models, leading to improvements in the future. Commercial art production, content moderation, and intellectual property management are just some of the possible fields in which our tool can be applied by maintaining quality levels for AI-generated artworks.

Link: <https://doi.org/10.1109/ESCI63694.2025.10988229>



## TITLE:

A hybrid approach to optimize engine performance and emission control in internal combustion engines using graphene quantum dots-enhanced biodiesel-diesel blends

## AUTHOR :

Srinivasan D.R.; Rajesh P.; Joshi S.P.; Kulkarni K.G.

## JOURNAL NAME:

Applied Thermal Engineering (Vol.-276)

## DETAILS:

Published on May 2025



## ABSTRACT:

Reducing harmful emissions while improving engine performance is a critical challenge in internal combustion (IC) engines. The usage of fossil diesel exacerbates environmental and health concerns, necessitating alternative fuel solutions. This study addresses this issue by proposing a hybrid deep learning model, WLSA-FEINN, to optimize and forecast engine performance and emissions utilizing carbon-doped graphene quantum dots (GQD) in biodiesel-diesel blends (BDB). The innovation of this research lies in integrating a global search algorithm (WLSA) with a physics-informed neural network (FEINN), creating a unique hybrid framework that not only improves predictive accuracy but also enhances the interpretability of fuel-performance relationships. The WLSA algorithm is employed to optimize key engine parameters, while FEINN ensures precise forecasting of engine performance and emissions from the exhaust. The proposed technique was implemented in MATLAB and compared against existing models, including Artificial Neural Networks (ANN), Recurrent Enhanced Recurrent Neural Networks (RERNN), and Deep Neural Networks (DNN). Results demonstrate that the B10 + E6 + GQD45 fuel blend improves brake power by 13.84 % compared to conventional diesel (D100), while reducing CO, UHC, and NOx emissions by 21.90 %, 25.48 %, and 27.34 %, respectively. The WLSA-FEINN model exhibited the highest prediction accuracy, achieving a Mean Squared Error (MSE) of 0.0001 and a Root Mean Squared Error (RMSE) of 0.0065 for Brake Specific Fuel Consumption (BSFC). These findings indicate that GQD-enhanced biodiesel blends significantly improve performance while reducing environmental impact.

Link: <https://doi.org/10.1016/j.applthermaleng.2025.126841>



## **TITLE:**

Challenges and Innovations in Developing PCK  
Among Pre-Service Teachers

## **AUTHOR :**

Nghiem X.-H.; Tharkude D.; Goyal N.; Chandel  
A.; Mittal S.

## **JOURNAL NAME:**

Current Trends and Best Practices of  
Pedagogical Content Knowledge (PCK)

## **DETAILS:**

Published February 2025



## **ABSTRACT:**

This chapter explores the development of Pedagogical Content Knowledge (PCK) among pre-service teachers, highlighting the challenges and innovations that shape their growth. Through detailed case studies, including the integration of technology, differentiated instruction, and culturally responsive teaching, the chapter examines effective strategies and the role of mentorship in enhancing PCK. It identifies common themes such as the importance of adapting teaching methods to diverse learner needs and the impact of reflective practice. Future directions emphasize the need for incorporating advanced technologies, data-driven instruction, and social-emotional learning into PCK frameworks. The chapter concludes by underscoring the significance of ongoing innovation and support in teacher preparation to improve educational outcomes.

Link: <http://dx.doi.org/10.4018/979-8-3693-0655-0.ch011>



## TITLE:

Experimental study on the stabilization of laterite soil with chitosan biopolymer for subgrade applications

## AUTHOR :

Banne S.P.; Ingle G.S.; Dhawale A.; Gaikwad S.;  
Bobade S.

## JOURNAL NAME:

Engineering and Applied Science Research  
(Vol.-52, Issue-3)

## DETAILS:

Published on 6 May 2025



## ABSTRACT:

Laterite soil, commonly found in the Konkan region in Maharashtra, India, often needs better engineering properties, posing challenges for its use in construction. By adding chitosan, a naturally occurring biopolymer derived from chitin, the study aims to enhance the geotechnical properties of laterite soil. Both untreated and chitosan-treated laterite soil samples were subjected to various laboratory tests, including the California Bearing Ratio (CBR), compaction, Atterberg limits, and direct shear testing. The chitosan was added in varying percentages (0.15%, 0.30%, and 0.45 % by weight) to determine the optimal dosage for laterite soil stabilisation. As the chitosan concentration increases from 0% to 0.3%, the Maximum dry density (MDD) value increases from 1.41 gm/cc to 1.92 gm/cc; adding chitosan further slightly decreases the MDD. The un-soaked CBR value of laterite soil containing 0.30% chitosan biopolymer increased by 108.81%, while the soaked CBR value increased by 142.83%. The soil's cohesiveness and internal friction angle increased by 120% and 15%, respectively, with the optimal dose of 0.30% chitosan. Utilising chitosan in T8 subgrade soil costs INR 6.48 crores, which is 2.57 times more than laterite soil, and requires a pavement depth of 1395 mm. In the case of T9 subgrade soil, at a depth of 1495 mm, the cost is INR 8.08 crores, which is 3.14 times more than that of laterite soil. This study highlights the potential of chitosan biopolymer as an eco-friendly and sustainable soil stabilizer for subgrade applications. It also offers a comprehensive cost-benefit analysis for pavement applications, demonstrating the financial feasibility of using chitosan biopolymer despite its higher initial costs.

Link: <https://ph01.tci-thaijo.org/index.php/easr/article/view/258628>



### TITLE:

Development & validation of level A: In-vitro and in-vivo correlation for ofloxacin using a systematic approach

### AUTHOR :

Makadiya N.; Padwal N.; Swami A.

### JOURNAL NAME:

Indian Journal of Chemical Technology (Vol.-32, Issue-2)

### DETAILS:

Published on June 2025



### ABSTRACT:

The key objective of the current research is to establish an IVIVC (in vitro and in vivo correlation) model for ofloxacin tablet formulations. The USP apparatus II is used to determine the in vitro drug release characteristics of drug, rpm ranging from 50-150, in a pH-varying medium. The in vitro dissolution testing is found to be applicable for calculating the in vivo drug concentration. Three different formulations are used for the study. The in vivo data is referred from the study aimed to assess bioequivalence of ofloxacin tablets. Plasma concentration is converted to cumulative percentages of drug absorbed using the Wagner-Nelson equation. The percentage in vitro cumulative drug dissolved, intercept, and slope are used to calculate the in vivo drug release. The cumulative drug release is plotted against the percent cumulative drug absorbed and the level A IVIVC model is developed using regression technique.

Link: <https://doi.org/10.56042/ijct.v32i2.10518>



## TITLE:

Machine Learning and Explainable AI for Thai Basil Growth Prediction in Hydroponics

## AUTHOR :

Kadam S.; Gohokar V.; Kute R.

## JOURNAL NAME:

IEEE Access (Vol.-13)

## DETAILS:

Published on 4 June 2025



## ABSTRACT:

Hydroponic farming has emerged as a sustainable solution to modern agricultural challenges, offering enhanced resource efficiency, reduced environmental impacts, and optimized crop growth. Deep-Water Culture (DWC) is a hydroponic technique that provides continuous nutrients and oxygenated water to plants to enhance plant growth compared to traditional hydroponic systems. Thai basil is a medicinal plant chosen for this study. The growth of the plant is affected due to temperature, humidity, solar radiation, pH and total dissolved solids (TDS). This study emphasizes the impact of DWC on cultivation of Thai Basil over a month monitoring environmental and physiological parameters. The green area and plant height are recorded as growth parameters. The six machine learning (ML) models are employed to estimate the growth of Thai Basil. The best model is selected based on the ensemble VotingRegressor method. The predictions of the best model are explained with Shapley Additive Explanations (SHAP) and Local Interpretable Model-agnostic Explanations (LIME) Explainable AI models. Explainable AI provides clear and understandable justifications for predictions. Using Explainable AI, the proposed research predicts Thai Basil growth while providing reasoning for its prediction.

Link: <https://doi.org/10.1109/ACCESS.2025.3576440>





## TITLE:

Automated Question Classification Based on Bloom's Taxonomy

## AUTHOR :

Naik V.; Bedekar M.; Apte A.; Atgur V.

## JOURNAL NAME:

Journal of Engineering Education Transformations (Vol.-38, Issue-Special Issue 2 )

## DETAILS:

Published on May 2025



## ABSTRACT:

This project attempts to revolutionize the process of question paper generation by automating the classification of questions according to revised Bloom's Taxonomy, to enhance the efficiency in evaluating cognitive levels, providing teachers with a valuable tool to create exam papers. Its value lies in its potential to revolutionize the process of making exam papers easily and in a short amount of time. The scope of our research project extends to personalized learning experiences and adaptive learning methodologies, which can be achieved by significantly increasing the amount of data to be processed, further refinement of the model and adding real-time feedback for continuous improvement. We have created this system especially for practical implications to simplify the exam paper assessment process, as well as for social implications as it could help to contribute to the everadvancing education industry by promoting inclusive learning environments and develop higher order thinking skills among students.

Link: <https://doi.org/10.16920/jeet/2025/v38is2/25013>



## TITLE:

Advancements In Heat Transfer: Metal-Foam  
Tube Banks For Compact Refrigeration Systems

## AUTHOR :

Dhavale A.A.; Lele M.M.

## JOURNAL NAME:

Special Topics and Reviews in Porous Media  
(Vol.-16, Issue-5)

## DETAILS:

Published on 2 May 2025



## ABSTRACT:

Traditional evaporator designs are bulky and heavy, limiting their use in compact and mobile refrigeration systems. Improving energy efficiency in refrigeration is essential for reducing operational costs and environmental impact. Open-cell metal foams (MFs), with their high surface area-to-volume ratio and superior thermal conductivity, offer a promising solution. This study investigates the feasibility of MF-wrapped staggered tube bundles in evaporators using numerical simulations in ANSYS Fluent 2021R2. The Darcy-Forchheimer-Brinkman momentum model and the local thermal equilibrium energy model are applied to analyze flow resistance and interstitial heat transfer. The effects of foam thickness and free stream velocity on heat transfer and pressure drop characteristics are examined. Results indicate that MF heat exchangers can outperform conventional compact heat exchangers under optimal conditions. Lower free stream velocities enhance heat transfer in fixed-thickness foam arrays. Additionally, thicker foam layers improve heat transfer rates but also increase pressure drop. An optimal dimensionless foam thickness is identified for maximizing the area goodness factor. Among the tested configurations, MF-3 demonstrated the highest performance, achieving a 60% increase in the Colburn factor at 5 m/s compared to MF-1. These findings highlight the potential of MF-wrapped tube bundles for enhancing evaporator efficiency in compact refrigeration systems.

Link:

<http://dx.doi.org/10.1615/SpecialTopicsRevPorousMedia.2025058462>



## TITLE:

A Decade of FDA-Approved Pharmacophore-Based Small Molecules: Advances in Medicinal Chemistry from 2014 to 2024

## AUTHOR :

Sanjaykumar R.S.; Basavaraj C.S.; Arshad A.S.M.; Singh R.; Mahindroo N.

## JOURNAL NAME:

Synlett

## DETAILS:

Published on 4 June 2025



## ABSTRACT:

Over the past decade, the pharmaceutical field has seen significant advancements with the approval of innovative small-molecule drugs by the FDA. These low molecular weight compounds have set new benchmarks in therapy. This review examines their design, medical applications, mechanisms of action, and impact across various areas of medicine. It also emphasizes the key structural features critical to their success, highlighting progress in medicinal chemistry.

Link: <http://dx.doi.org/10.1055/s-0043-1775470>



## TITLE:

Integration of Genetic Algorithm and Support Vector Machine for Water Discharge Prediction in River Basin System

## AUTHOR :

Yadav A.; Mishra H.; Pradhan A.K.; Sah B.;  
Joshi D.

## JOURNAL NAME:

ICDT 2025 - 3rd International Conference on  
Disruptive Technologies

## DETAILS:

Published on 13 May 2025



## ABSTRACT:

Water discharge (WD) is essential component of river hydrodynamics. It is crucial to predict WD for constructing reservoirs and dams, operations, management and river engineering studies. WD includes various complex nonlinear processes which depends on many variables. The WD prediction is complicated using traditional methods because these are unable to handle the complex nonlinear processes of it. WD prediction using novel artificial intelligence (AI) techniques is highly encouraged for its effectiveness in flood forecasting. A hybrid AI approaches is useful for WD prediction in Mahanadi River (MR), India. Support vector machine (SVM) is integrated with Genetic algorithm (GA) (GA-SVM) for optimization of all associated SVM parameters. Temperature(T), rainfall (R), water level (WL) and sediment yield (SY) are used as inputs parameters for prediction of WD. The standard statistical measures are used for the performance evaluation of GA-SVM model. Hybrid GA-SVM with automated parameter tuning model is developed for prediction of WD at Tikarapara location. It is outermost downstream station in the MR using hydro-climatical parameters. The developed GA-SVM model is compared to SVM, and multiple linear regression (MLR) to evaluate the ability of the models to predict the WD. The proposed GA-SVM model is provided satisfactory and better results for estimation of WD in the MR among all comparative models. This modelling approaches can be applied for the prediction of WD at gauge or ungauged places in MR due to its easiness in implement and satisfactory results.

Link: <https://doi.org/10.1109/ICDT63985.2025.10986493>



## TITLE:

Spatial gap solitons due to photonic lattices in photorefractive SBN crystals: An ab initio investigation

## AUTHOR :

Katti A.; Kumar R.; Chourasia N.K.; Umesh D.;  
Chourasia R.K.

## JOURNAL NAME:

Materialia (Vol.-42)

## DETAILS:

Published on May 2025



## ABSTRACT:

This manuscript presents the results of the first-principles calculations revealing the suitable candidature of strontium barium niobate (SBN) photorefractive crystals using globally accepted WIEN2k codes. These computations confirm the good candidature of SBN crystals for photorefractive nonlinear optics and the ensuing applications. Using the DOS, band structure, and optical investigations, these first principle computations address bandgap creation and estimate, directional-dependent refractive index calculation, and absorption coefficient estimation. Optical spatial gap solitons in SBN photorefractive media with Pockel's nonlinearity and an embedded photonic lattice have been the subject of further inquiry. We have setup and solved the paraxial Helmholtz equation along with the imprinted photonic lattice in SBN crystals. We have, for the first time uncovered the existence of many different types of single hump, double hump, and multi hump gap solitons across both the finite band gaps. Multi hump solitons found to exist are of both anti-symmetric and symmetric type with two distinct profiles being seen for the anti-symmetric multihump solitons across both band gaps. Stability of the solitons with respect to small perturbations has been studied in case of each type of soliton solution. Linear stability analysis reveals that all types of gap solitons, including the single hump, double hump and multi hump solitons are stable across both the first and second finite band gap which is quite a significant and novel finding. The linear stability analysis is duly confirmed by direct propagation simulations undertaken using the finite difference beam propagation method.

Link: <https://doi.org/10.1016/j.mtla.2025.102447>



## TITLE:

The Herd Mentality: Understanding the Theories and Models of Herding Behavior in Financial Markets

## AUTHOR :

Nerlekar V.S.; Sane A.; Gadekar M.; Gupta S.K.; Waghulkar S.

## JOURNAL NAME:

Psychological Drivers of Herding and Market Overreaction

## DETAILS:

Published on December 2024



## ABSTRACT:

This chapter explores herding behavior in financial markets, where individuals follow the actions of a larger group, impacting market dynamics and asset prices. It covers key theories and models, such as social influence, behavioral finance, and empirical studies, to explain why herding occurs. Psychological biases like overconfidence, fear, and greed are highlighted as drivers of this behavior. Models such as rational expectations, noise traders, and information cascades are discussed, along with methods to measure herding. Case studies like the dot-com bubble and the 2008 financial crisis demonstrate its effects on market volatility and efficiency. The chapter also addresses regulatory implications and future research on the influence of technology and social media in shaping herding.

Link: <http://dx.doi.org/10.4018/979-8-3693-7827-4.ch010>



### TITLE:

Enhanced biomechanical performance of 3D-printed Ti6Al4V bone screws: A breakthrough in orthopaedic fixation

### AUTHOR :

Agarwal R.; Gupta V.; Jain V.; Travascio F.

### JOURNAL NAME:

Materials Chemistry and Physics (Vol.-345)

### DETAILS:

Published on June 2025



### ABSTRACT:

The rising incidence of osteoporosis-related fractures underscores the need for improved orthopaedic implants. Additive manufacturing (AM) enables patient-specific implant fabrication with enhanced mechanical properties. This in-vitro study utilised AM technology to fabricate titanium cortical screws, aiming to improve pullout strength and osseointegration across varying bone mineral densities (BMDs). The effects of BMD on AM cortical screws were examined in porcine femur bones of different groups and comparative analysis was conducted with conventional surgical stainless steel and titanium screws. Samples were preserved in simulated body fluid solution for in-vitro evaluation of bone-screw interfaces. Results demonstrated significantly higher bone-bonding ability and hydroxyapatite accumulation in AM screws compared to conventional screws. The microporous, micro-roughened surfaces of AM-fabricated titanium screws enhance biomechanical pullout strength in various bone densities. Furthermore, both BMD and gender significantly influenced screw performance. These findings highlight the potential of AM technology in orthopaedic fixation, offering improved biomechanical performance for diverse patient populations.

Link: <https://doi.org/10.1016/j.matchemphys.2025.131187>



## TITLE:

Review of sentiment analysis in social media using big data: techniques, tools, and frameworks

## AUTHOR :

Patil S.S.; Suryawanshi V.P.; Patil S.M.; Girase S.P.; Bhagat D.A.

## JOURNAL NAME:

International Journal of Basic and Applied Sciences (Vol.-14, Issue-2)

## DETAILS:

Published on June 2025



## ABSTRACT:

Sentiment analysis on social media has emerged as a vital research area due to the growing volume of user-generated content and the in-creasing reliance on data-driven decision-making. The adoption of big data technologies has greatly improved sentiment analysis by enabling the rapid processing of unstructured big data. This review presents an in-depth analysis of sentiment analysis methodologies, covering both conventional machine learning (ML) techniques-such as Naïve Bayes, Support Vector Machines, Decision Trees, and Random Forest and advanced deep learning (DL) models, including Recurrent Neural Networks, Long Short-Term Memory Networks, Convolutional Neu-ral Networks, and Transformer-based architectures like Bidirectional Encoder Representations from Transformers (BERT) and Generative Pre-trained Transformers (GPT). Furthermore, it examines big data frameworks like Hadoop, Apache Spark, and Apache Flink, along with Natural Language Processing (NLP) tools such as the Natural Language Toolkit (NLTK), spaCy, TextBlob, and Stanford NLP. The paper also discusses ML/DL frameworks like Scikit-learn, TensorFlow, PyTorch, and Keras, along with cloud and edge computing solutions like Google Cloud Artificial Intelligence (AI), Amazon Web Services (AWS) Comprehend, and Edge AI (NVIDIA Jetson). Despite technological advancements, several challenges persist, including issues related to data quality, real-time processing limitations, multilingual analysis complexities, and ethical concerns regarding bias and privacy. The field is also witnessing promising developments, such as Explainable Artificial Intelligence (XAI), federated learning, edge computing, and quantum computing, which offer new directions for future research and practical implementations. This review provides researchers and professionals with valuable insights, outlining potential improvements in sentiment analysis techniques to enhance accuracy, scalability, and ethical considerations across various sectors, including business, healthcare, and smart manufacturing.

Link: <http://dx.doi.org/10.14419/mhv83077>



## TITLE:

Evaluating Economic Benefits of AI-Powered  
Crash Prevention Technologies

## AUTHOR :

Surya S.; Langote V.B.; Ahammed J.; Siddapur  
L.; Kuzieva N.; Chouhan K.

## JOURNAL NAME:

AI's role in enhanced automotive safety

## DETAILS:

Published on May 2025



## ABSTRACT:

Economic impact of AI intervention in crash prevention systems through the use of computer simulations using digital twins done with Siemens NX and Simcenter. The research shows how the technology can virtually explore several angles of the crash and fine-tune its AI algorithms, as well as estimate practical risks and cost factors. Trial outcomes indicate an overall collision rate reduction by 40%, 30% lower medical expense, and 25% lower cost of vehicle repair in comparison to conventional as well as AI-based approaches separately. Further, this approach retained 85% of crash prediction accuracy besides cutting down false positive by 15% hence, increasing system credibility. The effectiveness of Digital Twins for scenario testing and cost calculation is underlined, thus the potential of the proposed approach for the future development of crash prevention systems is scalable. It is ascertained in the research that simulation-based assessments offer a stable paradigm for comparing AI-driven safety features in automobiles hence earning better road safety and economic impacts.

Link: <http://dx.doi.org/10.4018/979-8-3373-0442-7.ch016>



## TITLE:

Evaluation of net-zero materials in mortar bricks with predictive modelling using random forest and gradient boosting techniques

## AUTHOR :

kiran G.U.; Ganesan N.; Roy D.; Shinde S.N.; Indumathi M.; Alaneme G.U.; Eze V.H.U.; Anton K.

## JOURNAL NAME:

Discover Applied Sciences (Vol.-7, Issue-6)

## DETAILS:

Published on 27 May 2025



## ABSTRACT:

This study investigates the potential of incorporating alternative waste materials—limestone (LS) powder and construction and demolition waste (CDW)—in sustainable brick production under real-time curing conditions. Cement was partially replaced with LS powder in the range of 0–20% by weight, while natural aggregates were substituted with CDW at 0–100%. Experimental evaluations were conducted to assess the mechanical properties of the fabricated bricks. The results demonstrated a notable enhancement in performance compared to conventional bricks, with a maximum compressive strength of 14.99 N/mm<sup>2</sup> observed at 2% LS and 10% CDW replacement levels. Additionally, a significant reduction in water absorption was recorded. Machine learning models, including Random Forest and Gradient Boosting, were employed to predict mechanical behavior. The findings underscore the feasibility of producing eco-efficient bricks by valorizing industrial waste within a circular construction framework.

Link: <http://dx.doi.org/10.1007/s42452-025-07159-y>



## TITLE:

Impact of Sasobit and Zycotherm additives on the performance of warm mix asphalt: enhancing rutting resistance and moisture durability

## AUTHOR :

Kushwaha P.; Gautam L.; Sharma K.V.;  
Chauhan A.S.; Swami B.L.

## JOURNAL NAME:

Journal of Building Pathology and Rehabilitation  
(vol.-10, Issue-2)

## DETAILS:

Published on 7 June 2025



## ABSTRACT:

Warm mix asphalt (WMA) offers a more sustainable option compared to conventional hot mix asphalt (HMA) by lowering production temperatures, cutting down energy use, and minimizing emissions. This research examines the effects of Sasobit (an organic additive) and Zycotherm (a chemical additive) on the performance characteristics of WMA mixtures. The experimental program included tests such as Tensile Strength Ratio (TSR), Indirect Tensile Strength (ITS), Dynamic Creep and Wheel Tracking Resilient Modulus (MR). Findings revealed that WMA mixtures incorporating 2.5% Sasobit had a 14.24% inferior rut depth than HMA, which can be attributed to the increased stiffness provided by Sasobit's lattice structure. Zycotherm-treated samples at 0.1% dosage demonstrated a 20% increase in moisture resistance by ITS and TSR values suggesting enhanced durability against moisture-induced damage. Dynamic creep tests revealed that WMA-Sasobit mixtures accumulated less permanent strain over 1800 cycles compared to HMA, signifying better long-term deformation resistance. These findings underscore the potential of Sasobit and Zycotherm additives to enhance the durability of WMA, making it a robust alternative for sustainable road construction. Incorporating these additives can significantly improve pavement performance, lessen maintenance costs, and extend the existence of road surfaces.

Link: <http://dx.doi.org/10.1007/s41024-025-00642-4>



### **TITLE:**

Entrepreneurship sustainability prediction system: a study based on climatic changes

### **AUTHOR :**

Pasumarti S.S.; Panda A.

### **JOURNAL NAME:**

International Journal of Operational Research  
(Vol.-53, Issue-2)

### **DETAILS:**

Published on 25 June 2025



### **ABSTRACT:**

The present study relates to a system and method for predicting entrepreneurship sustainability which aids to develop their social and environmental responsibilities towards the society and increase their own sustainability with the available and predicted resources. The system comprises a business data module (BDM), an environmental data module (EDM), an analysing module (AM), a ranking module (RM), and a suggestion module (SM). Thus, the entrepreneur is suggested with the chances and risks in the future with the available resources in a specific geometrical region or with the changes in the environment based on the ranking allocated.

Link: <https://doi.org/10.1504/IJOR.2025.146903>



## TITLE:

Transmission Based Association Test for Multivariate Phenotype Using Quasi Likelihood

## AUTHOR :

Kulkarni H.; Ghosh S.; Singh A.

## JOURNAL NAME:

Sankhya B

## DETAILS:

Published on 28 May 2025



## ABSTRACT:

The transmission disequilibrium test (TDT) is a family-based alternative to the population-based case-control test for genetic association and is protected against inflated rates of false positives that may emerge due to potential population substructures. The majority of complex genetic traits are governed by quantitative precursors and it may be a more prudent strategy to analyze these quantitative traits instead of the binary end-point clinical trait. However, a single quantitative trait may not be a sufficiently good surrogate for the clinical end-point and tests based on a multivariate phenotype vector comprising the precursor variables may yield higher power to detect association. We propose a model-free family based test procedure for testing association in the presence of linkage for multivariate phenotypes. The parameters are estimated using resistance generalized estimating equations (RGEE). The test procedure is easily extended for the multivariate phenotypes consisting the mixture of continuous and categorical phenotypes. We carry out extensive simulations under a wide spectrum of genetic models to compare the performance of the proposed test procedure with family-based tests for multiple phenotypes FBAT-GEE and univariate test procedures. Our findings indicate that the statistical power of the proposed test is comparable to that of FBAT-GEE. The proposed test procedure is superior than the univariate test procedures for the phenotype that contain less genetic information. While, it is marginally less powerful than univariate method for the phenotypes that exhibit a strong association with genetic factors.

Link: <http://dx.doi.org/10.1007/s13571-025-00365-z>





## TITLE:

Enhancing Data Security in Transmission  
Through Quantum Key Distribution in  
Cryptography

## AUTHOR :

Malwade S.; Choudhary S.; Lavate S.H.; Mahalle  
P.N.; Ajani S.N.; Khetani V.

## JOURNAL NAME:

2025 International Conference on Emerging  
Smart Computing and Informatics, ESCI 2025

## DETAILS:

Published on 9 May 2025



## ABSTRACT:

As the world becomes more computerized, keeping data transfer safe has become very important. Quantum computers and other strong computers have the ability to break classical encryption methods, even though they are widely used. Quantum Key Distribution (QKD) is a new way to protect data. It uses quantum physics to make sure that the sharing of cryptographic keys is safe. The aim of this study is to look into how QKD can be used to improve the security of data transfer. The suggested method combines QKD with current encryption standards to create a safe and effective way to send data. The method includes setting up a key sharing system based on QKD and then using symmetric encryption algorithms to keep the data being sent safe. The system is tried in different communication settings to see how well it protects against spying and "man-in-the-middle" attacks. The study's results show that QKD greatly improves the safety of sending data by keeping the cryptography keys secret. The results show that QKD has the potential to stop people from getting in without permission and find any attempts to change the keys while they are being sent out. The table below shows performance numbers that show how well QKD works in real-world situations. It shows how well communication speeds and security measures compare.

Link: <https://doi.org/10.1109/ESCI63694.2025.10987916>



## TITLE:

Enhancing Deep Learning Models for Vulnerability Detection through Fuzzy-Based Software Reconstruction in OOP

## AUTHOR :

Gawade Mmg M.M.

## JOURNAL NAME:

2025 International Conference on Data Science, Agents and Artificial Intelligence, ICDSAAI 2025

## DETAILS:

Published on 29 May 2025



## ABSTRACT:

As software systems continue to evolve to their complexities, vulnerability detection in code is a daunting task. Traditional techniques, such as static analysis alone, usually fail to deliver vulnerabilities in object-oriented programming languages alone, because they inherit complexities like polymorphism, inheritance hierarchies, and encapsulation. This paper would introduce a novel approach that would be based on deep learning-based vulnerability detection with the involvement of fuzzy clustering techniques in code restructuring in OOP-based systems. Deep learning models such as DNNs, CNNs, and RNNs provide a better way of learning code patterns for the identification of vulnerabilities like buffer overflows, SQL injections, and cross-site scripting attacks. However, the state of features in OOP sometimes demands extra strategies to raise the precision of detection. Fuzzy clustering is used to cluster similar code patterns. It tracks the vulnerability that may remain undiscovered using traditional analysis techniques. The restructuring of complex OOP code-the flattening of inheritance hierarchies, reduction of polymorphic behaviors, and enhancing encapsulation access-halves the process in such analyses being more efficient in detecting vulnerabilities. This is how deep learning and fuzzy clustering could provide an efficient solution to enhance the security of software systems by overcoming shortcomings of traditional approaches and complexities accompanying modern OOP-based applications.

Link: <https://doi.org/10.1109/ICDSAAI65575.2025.11011731>



## TITLE:

Design, Development and Analysis of Seat  
Constrainer System for a Car

## AUTHOR :

Tamkhade P.K.; Naikwadi V.A.; Kulkarni K.G.;  
Todkar R.N.; Pisal H.C.; Joshi M.D.

## JOURNAL NAME:

International Journal of Vehicle Structures and  
Systems (Vol.-17, Issue-1)

## DETAILS:

Published on 17 April 2025



## ABSTRACT:

Adjusting the seat in a comfortable and preferred position is an important aspect of driving a car as it affects visibility, distance between pedals and feet, steering wheels and hands. Many times a seat is adjusted while the vehicle is in motion but it causes a seat to move suddenly too much forward or backward due to inertia which causes difficulty for the driver to adjust the seat. While driving, it also distracts the driver. Both of these can cause serious accidents and poses a huge risk to pedestrians and other road users. To reduce this, a constrainer system for seats is suggested and a prototype is developed to constrain the adjustment of seat while the vehicle is in motion. Arduino, hall sensor and actuators are used for developing the locking mechanism. FEA is performed for a component of the locking mechanism for the seat constrainer system. Based on analysis, the prototype is manufactured and tested.

Link: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-105009158082&doi=10.4273%2fijvss.17.1.03&partnerID=40&md5=8eb9b7b6491c7f0afd09ae2125d1d155>



## TITLE:

Restructuring lost worlds: Role of virtual reality in historical restoration

## AUTHOR :

Chaudhary N.; Singh R.; Thakur S.; Thakur P.

## JOURNAL NAME:

Hotel and Travel Management in the AI Era

## DETAILS:

Published on August 2025



## ABSTRACT:

This chapter analyzes the importance of historical reconstruction in the tourism and hospitality sector. This chapter examines the role of virtual reality (VR) in bringing the history back to life in tourism and hospitality. Considering recent developments in VR, this chapter explores the educational benefits in the historical sector, and the benefits of this technology in historical reconstruction. As the authors explore this further, it can be seen the role of VR to rove through ancient cities and gain an innate understanding of people's lives who lived in earlier centuries. This chapter will uncover the collaborative efforts made by archaeologists, historians, and technologists for the successful implementation of VR technology in boosting tourism. Sustainability concerns and long-term maintenance of VR-enhanced historical sites. By relying on references from early adopters in the fields of digital archaeology and VR development, the authors will look for the potential of this technology for connecting us with our legacy in previously unbelievable ways.

Link: <http://dx.doi.org/10.4018/979-8-3693-7898-4.ch020>



## TITLE:

Capacitated Vehicle Routing Problem using Ant Colony Optimization and PuLP Library

## AUTHOR :

Umbrani K.; Choreria P.; Kulkarni P.V.; Shah D.;  
Tarneja R.

## JOURNAL NAME:

2025 International Conference on Emerging  
Smart Computing and Informatics, ESCI 2025

## DETAILS:

Published on 9 May 2025



## ABSTRACT:

Routing determines the best path for resources or data to travel, essential in sectors like networks, telecommunications and transportation. Finding the most effective routes for a fleet of vehicles to provide goods or services while taking into account variables like vehicle capacity and speed is the goal of the Vehicle Routing Problem (VRP). Solving VRP optimizes resource use, reduces costs, and boosts operational efficiency. The VRP impacts delivery schedules, vehicle maintenance and driver workloads. Optimal VRP solutions enhance delivery reliability and timeliness, crucial for customer satisfaction and competitive advantage. The Capacitated Vehicle Routing Problem (CVRP) addresses real-world challenges by ensuring efficient load balancing and preventing overloading or underutilization. CVRP solutions improve fuel economy, reduce carbon emissions and create a more cost-effective, sustainable transportation system. In order to find the best route for a fleet of capacitated vehicles, we compare the PuLP library with Ant Colony Optimization (ACO) in this study. Our study aims to evaluate the efficiency of these two methodologies in solving the capacitated vehicle routing problem (CVRP), focusing on their performance in identifying the most efficient routes under given constraints. Based on the findings, the methodology that demonstrates superior performance will be implemented in the development of a user-facing system to optimize vehicle routing for practical applications.

Link: <https://doi.org/10.1109/ESCI63694.2025.10988157>



## TITLE:

$h$ -extra  $r$ -component connectivity of  $k$ -ary  $n$ -cubes

## AUTHOR :

Jagadale U.; Shinde A.; Malavadar P.

## JOURNAL NAME:

Discrete Mathematics, Algorithms and Applications

## DETAILS:

Published on May 2025



## ABSTRACT:

The  $k$ -ary  $n$ -cube, denoted by  $Q_{kn}$ , is one of the important interconnection networks for parallel and distributed computing systems. In this paper, we examine its fault-tolerant properties in the context of  $h$ -extra  $r$ -component connectivity. Let  $G$  be a connected graph. For integers  $h \geq 0$  and  $r \geq 2$ , an  $h$ -extra  $r$ -component cut is a subset  $F$  of  $V(G)$  such that  $G - F$  results in a disconnected graph with at least  $r$  components and each component contains more than  $h$  vertices. The  $h$ -extra  $r$ -component connectivity of  $G$ , denoted by  $\kappa_{hr}(G)$ , is the minimum size of an  $h$ -extra  $r$ -component cut of  $G$ . We investigate the  $h$ -extra  $r$ -component connectivity of  $k$ -ary  $n$ -cubes for  $h=1$  and  $r=3$ , and determine that  $\kappa_{13}(Q_{kn}) = 8n - 8$ , for  $k \geq 4$  and  $n \geq 3$ . Furthermore, we derive an upper bound on the  $1$ -extra  $(r+1)$ -component connectivity of  $k$ -ary  $n$ -cubes for  $k \geq 4$  and  $1 \leq r \leq n-1$  as  $\kappa_{1r+1}(Q_{kn}) \leq -r^2 + (4n-3)r + 2$ .

Link: <https://doi.org/10.1142/S1793830925500946>





## TITLE:

Data-driven insights: exploring the influence of enterprise resource planning systems on managerial decision processes

## AUTHOR :

Patil S.S.; Deshpande D.S.; Londhe R.J.; Mapari S.A.; Naik S.A.; Metkewar P.S.

## JOURNAL NAME:

International Journal of Business Process Integration and Management (Vol.-12, Issue-1)

## DETAILS:

Published on 2 June 2025



## ABSTRACT:

Enterprise resource planning (ERP) systems are being significantly impacted by data driven decision making (DDDM) processes and managerial decision processes. The study explores how ERP influences management decision processes. Also, this study intends to determine DDDM with the mediating effect on ERP and managerial decision process (MDP). The recognised questionnaires were circulated to 447 managers of SMEs in India. Using a non-probability convenience sample approach, it was possible to investigate how DDDM in ERP improved. The outcome demonstrates that performance expectancy (PE) has a significant impact on ERP.

Link: <https://doi.org/10.1504/IJBPIIM.2025.146547>



## TITLE:

Multi-feature classification for fake news detection using multiscale and atrous convolution-based adaptive temporal convolution network

## AUTHOR :

Rane R.; Subhashini R.

## JOURNAL NAME:

Data and Knowledge Engineering (Vol.-160)

## DETAILS:

Published on June 2025



## ABSTRACT:

In the exponential growth of social media platforms, Facebook, Twitter, YouTube and Instagram are the main sources for providing news and information about anything at anywhere. Sometimes, fake information is quickly spread by uploading from particular people affecting the media usage of people. In this research work, a novel deep learning-based framework is proposed to effectively detect fake news for enhancing the trust of social media users. At first, the required text data is gathered from the benchmark resources and given to the preprocessing stage. Then, the preprocessed data is fed into the feature extraction phase here, the Bidirectional Encoder Representations from Transformers (BERT), Recurrent Neural Networks (RNN), and Convolutional Neural Networks (CNN) mechanisms are utilized to effectively extract the meaningful information from the data and improve the accuracy. Also, it can generate three sets of BERT, temporal, and spatial features in the extraction phase and then given to the detection phase. Here, the Multiscale and Atrous Convolution-based Adaptive Temporal Convolution Network (MAC-ATCN) is used for ultimately identifying and categorizing the false information to ensure more reliable outcomes and decision-making processes. Additionally, the Modified Osprey Optimization Algorithm (MOOA) algorithm is employed to fine-tune the parameters to prevent overfitting issues when dealing with larger data. It helps to easily address the imbalanced dataset issues by varying the hyperparameters in the training process. Finally, the overall detection performance is validated with various performance measures and compared with existing works. Also, the developed method achieved better accuracy value for dataset 1 is 93.74 % and dataset 2 is 92.82%. By effectively identifying the fake news in social media can help users to make timely informed decisions. This helps to prevent the spread of misinformation and protects individuals from harmful consequences.

Link: <https://doi.org/10.1016/j.datak.2025.102469>



## TITLE:

Ceramic Tile Waste as an Adsorbent for Dye Waste Water Treatment

## AUTHOR :

Dhoot T.R.; Dhanorkar P.D.; Sawant S.V.;  
Kulkarni A.D.

## JOURNAL NAME:

Lecture Notes in Civil Engineering (Vol.-581)

## DETAILS:

Published on 21 May 2025



## ABSTRACT:

The use of ceramic waste to treat dye waste water has been studied. Ceramic tile waste from construction site was washed, dried, and ground in a ball mill. After sieving, 120 mesh undersize material was dried at 1300C for 6 h to remove the water content. The resultant powder was used as the adsorbent. 1 gm of adsorbent was added to 100 ml of 5 ppm methylene blue dye solution and stirred on a magnetic stirrer at 500 rpm under ambient conditions. The change in absorbance was recorded on Ultraviolet (UV) Spectrophotometer at 15-min intervals for 90 min. The maximum dye removal efficiency was 90.74%. The system exhibited pseudo-second-order kinetics. The effect of particle size on the adsorption capacity was studied too. It was found that the adsorption capacity decreased with increasing particle size but remained constant above 1 mm. The used adsorbent was regenerated by heating it to a temperature of 5500C in an oven for a period of 1 h. The above experiments were performed on different tile grades and the efficiencies were compared. The characterization of the powders was done by the SEM (Scanning Electron Microscopy). The results indicate that using ceramic tile waste can be effectively used as an adsorbent for dye waste water treatment. It also provides an environmentally friendly way of recycling ceramic waste.

Link: [http://dx.doi.org/10.1007/978-981-96-2092-0\\_7](http://dx.doi.org/10.1007/978-981-96-2092-0_7)



## TITLE:

A study on de-contamination of dairy wastewater using natural coagulants

## AUTHOR :

Mishra L.; Bhowmik P.N.; Anand P.; Yantrapalli S.

## JOURNAL NAME:

Environmental Monitoring and Assessment (Vol.-197, Issue-6)

## DETAILS:

Published on 26 May 2025



## ABSTRACT:

Dairy wastewater is a major environmental challenge owing to its high organic load, which poses risks to aquatic ecosystems and water quality. This study investigated the use of sustainable natural coagulants, specifically *Carica papaya* seeds, *Citrus limetta* peels, and *Moringa oleifera*, for treating dairy wastewater. These coagulants offer eco-friendly alternatives to conventional chemical methods. The Jar test method was applied to determine the maximum removal efficiencies for biochemical oxygen demand, total dissolved solids, and turbidity in dairy wastewater. Key parameters, including coagulant dosage (0.05-0.5 g), contact time (10-30 min), and pH (5-7), were optimized and statistically analyzed using Behnken design. The results demonstrated that *Citrus limetta* peels achieved 93.8% removal of biochemical oxygen demand, whereas *Carica papaya* seeds and *Moringa oleifera* showed 74% efficiency in reducing turbidity and total dissolved solids. This research supports sustainable wastewater management by promoting the use of agricultural waste materials for pollutant removal, thereby advancing circular economic practices within the dairy industry. The use of natural coagulants not only reduces the environmental impact of dairy wastewater, but also provides an accessible and cost-effective treatment option, recommending their broader application in wastewater treatment facilities.

Link: <https://doi.org/10.1007/s10661-025-14117-z>





## TITLE:

Leveraging Usage of AI in education:  
Knowledge, Attitude and Behavioral Analysis on  
Students

## AUTHOR :

Roy B.; Acharjee P.B.; Sharma R.K.; Kramsapi  
R.; Shruti P.

## JOURNAL NAME:

Northeast Journal of Complex Systems (Vol.-7,  
Issue-1)

## DETAILS:

Published on June 2025



## ABSTRACT:

The paper explores the possible advantages and drawbacks of artificial intelligence (AI) on sustainability, with an emphasis on using AI to positively achieve SDGs. The study finds a significant vacuum in the literature on the association between knowledge, attitudes, and behaviors towards the use of AI tools and techniques in education and demographic characteristics (sex, age, education level, area of study, and city of origin). The purpose of this research is to close this knowledge gap and advance our understanding of how these demographic factors affect the integration of AI in educational environments. The study specifically aims to comprehend how students' awareness, beliefs, and actions towards AI in educational situations are influenced by demographic characteristics. This research attempts to offer insights into practical methods for utilizing AI in education while addressing potential obstacles and minimizing negative effects through a thorough analysis of data gathered from students across a range of demographic backgrounds.

Link: <https://doi.org/10.63562/2577-8439.1092>



## TITLE:

Laravel Technology based Maternal e-Healthcare Systems with Improved Response Time and Stability

## AUTHOR :

Dhage P.C.; Thakker R.A.; Warhade K.K.

## JOURNAL NAME:

International Research Journal of Multidisciplinary Technovation (Vol.-7, Issue-3)

## DETAILS:

Published on May 2025



## ABSTRACT:

Various maternal e-healthcare systems contribute a great deal to providing holistic care, but most of them are rife with technological constraints that make it impossible for them to address the needs of modern healthcare. The constraints consist mostly of obsolete infrastructures, limited and inefficient integrations, with poor large-scale operational management systems. Literature cited the maternal e-health systems are facing challenges in the area of interoperability, scalability, security, and usability. Key performance indicators to consider encompass response time and stability of the system. Mechanisms in the Laravel Framework are used to address the issues raised by the following: module-based architecture, caching, and queue management. It should however be noted that literature has shown an apparent gap of research that has greatly impacted on response time and stability in maternal e-health systems. Additionally, there is a critical lack of slim systems broad integration that's driven by data. To fill these gaps, this research is intended to strengthen the two performance indicators by means of Laravel use. The research enhances the given e-healthcare system, to increase performance outcomes regarding response time and system reliability, through the use of the Laravel framework, on the modules including user authentication, data collection, and report generation. Detailed performance measures to be studied will include load, stress, and endurance testing with JMeter in response time, and throughput, and error rate settings. The assessment of system performance based on the functionality of Laravel focused on the following metrics concerning the predetermined service-level agreement: mean response time, throughput, and error rates. The results from the analyses are merged with the graphs and tables which indicate an improvement in performance.

Link: <https://doi.org/10.54392/irjmt25324>



## TITLE:

Comparing Machine Learning Models for Thyroid Prediction

## AUTHOR :

Agrawal A.; Kanade P.; Kulkarni P.S.; Firmin S.

## JOURNAL NAME:

Learning and Analytics in Intelligent Systems  
(Vol.-43)

## DETAILS:

Published on 16 May 2025



## ABSTRACT:

Machine learning is an effective method for making predictions and diagnosing thyroid disease by analyzing large patient datasets to identify patterns and correlations. It can improve disease diagnosis accuracy and identify patients at risk. The paper focuses on machine learning's use to analyze and classify thyroid disease using Aadesh Medical College and Hospital data, encompassing demographics of patients, histories of illness, and findings from the lab. This analysis can train machine learning models to predict disease onset and severity and create personalized treatment plans. The dataset we have used includes patient demographics, thyroid profile (T3 and TSH levels), complete blood count (CBC) results, and comorbidities (such as diabetes, hypertension, and cardiovascular disease). Among the approaches we employ are decision tree optimization, frontier boosting, logistical regression estimation, support vector machine, and linear regression (LR). In order to enhance the models' training, we have also used a number of hyperparameters, including C, "break\_ties," "cache\_size," "class\_weight," "coef0," "degree," "gamma," "kernel," "max\_iter," "probability," "random\_state," "shrinking," "tol," and "verbose." The decision tree (regressor) model's accuracy of 97.53% produces the best results, and another standout aspect of our work is the achievement of over 96.29% accuracy levels for the linear regression models. Other research studies may have used these methods, but their reported accuracies for these two models do not match ours.

Link: [http://dx.doi.org/10.1007/978-981-97-9855-1\\_23](http://dx.doi.org/10.1007/978-981-97-9855-1_23)



### TITLE:

Green synthesis of ultrafine zinc oxide nanoparticles for photocatalytic degradation of methylene blue dye: Optimization and kinetic studies

### AUTHOR :

Kandasamy M.; Suresh S.; Rameshkumar P.; Jayasree R.; Sathishkumar P.; Gunnasegaran P.; Topare N.S.; Thambidurai S.; Arumugam J.; Jothilakshmi R.; Pugazhenthiran N.

### JOURNAL NAME:

Results in Engineering (Vol.-27)

### DETAILS:

Published on 2025



### ABSTRACT:

Zinc oxide nanoparticles (ZnO NPs) were synthesized using *Phyllanthus acidus* leaf extract by means of its reduction and stabilization tendency. The prepared ZnO NPs were systematically characterized by X-ray diffraction, Rietveld refinement, Brunauer–Emmett–Teller, X-ray photoelectron spectroscopy, field emission scanning electron microscopy, transmission electron microscopy, energy dispersive X-ray spectroscopy and UV–Visible diffuse reflectance spectroscopy techniques. X-ray diffraction analysis confirmed the development of ZnO NPs with hexagonal wurtzite structure. Rietveld refinement analysis disclosed consistency of lattice parameters (a and c) and cell volume with hexagonal wurtzite structure. Observed  $R_p$ ,  $R_{wp}$  and  $\chi^2$  values indicated better profile refinement of ZnO NPs. According to field emission scanning electron microscopy and transmission electron microscopy analyses, the ZnO was composed of ultrafine nanoparticle morphology with size ranged between 15 and 30 nm and a mean particle size of 22 nm. Brunauer–Emmett–Teller method was employed to evaluate texture features of ZnO NPs and determined their surface area (21.2016 m<sup>2</sup>/g). Optical analysis disclosed that the green synthesized ZnO NPs had band gap energy value of 3.21 eV. The ZnO NPs were effectively utilized for photodegradation of methylene blue dye under simulated solar light illumination and achieved a maximum degradation efficiency of 72 % at 90 min. The insights about green synthesized ZnO NPs and their photocatalytic application are thoroughly explained in detail.

Link: <https://doi.org/10.1016/j.rineng.2025.105846>



## TITLE:

Protective effects of *Helicteres isora* L. fruit extract on phenylhydrazine-induced hemolytic anemia in rats

## AUTHOR :

Gomase V.G.; Murudkar P.H.; Mote C.S.; Baheti A.M.; Tagalpallewar A.A.; Pawar A.T.

## JOURNAL NAME:

Pharmacological Research - Natural Products (Vol.-2)

## DETAILS:

Published on March 2025



## ABSTRACT:

Background: Anemia is a serious global public health problem that affects young children and pregnant women with an increased risk of maternal and child mortality. *Helicteres isora* L. (Family: Malvaceae) has significant antioxidant properties responsible for its medicinal properties. The present study was conducted to investigate the protective effects of aqueous fruit extract of *Helicteres isora* L. (AEHI) on phenylhydrazine-induced hemolytic anemia in rats

Methods: The fruits of *Helicteres isora* L. (*H. isora* L.) were extracted with distilled water to obtain the AEHI. The AEHI was subjected to preliminary phytochemical analysis, iron estimation and in-vitro antioxidant assay. The HPTLC fingerprinting followed by HR-LCMS analysis of the isolated HPTLC fraction of AEHI was carried out to investigate the phytoconstituents. Male Wistar albino rats were administered phenylhydrazine (40 mg/kg, i.p.) for two consecutive days to induce anemia. The effects of AEHI were investigated at three oral doses viz. 250, 500 and 750 mg/kg once daily for 13 days by estimating blood parameters and pathological changes in the liver, heart, spleen, kidney, lungs and bone marrow.

Results: The phytochemical analysis showed the presence of alkaloids, tannins, phenolic compounds, carbohydrates and steroids in the AEHI. The iron content of AEHI was found to be 208 µg/ml. In-vitro antioxidant assays, the IC<sub>50</sub> value of AEHI was found to be 90.01 µg/ml. Phenylhydrazine administration caused a significant decrease in red blood cells, hemoglobin, and hematocrit levels. These decreased levels were significantly improved by AEHI in a dose-dependent manner. Pathological changes in the liver, heart, spleen, kidney, lungs and bone marrow were prevented by AEHI treatment.

Conclusion: It is concluded that the AEHI provides significant protection against phenylhydrazine-induced hemolytic anemia.

Link: <https://doi.org/10.1016/j.prenap.2024.100021>



## TITLE:

Breaking the brain barrier: Hybrid nanoparticle-enabled delivery for next-gen neurotherapeutics

## AUTHOR :

Dargude S.; Chabukswar A.; Jagdale S.

## JOURNAL NAME:

Hybrid Advances (Vol.-11)

## DETAILS:

Published on June 2025



## ABSTRACT:

Neurological disorders are beholden for mortality, morbidity, and disability. According to the new WHO position paper promulgated on August 9, 2022, “Disorders of the nervous system are the second commanding antecedent of death globally, accounting for 9 million deaths per year”. The physiological structure, components and their function in maintaining the integrity of blood brain barrier (BBB), limits the entry of drugs. Various transport mechanisms are discussed, such as paracellular, transcellular, carrier-mediated transport, adsorptive mediated transport, and receptor-mediated transport. Delivering therapeutics across the BBB while avoiding neurotoxins is the primary challenge in formulating novel pharmaceutical drug delivery alternatives for the treatment of brain diseases. A strategy based on nanotechnology can improve a drug's pharmacokinetic profile and optimize drug transport. Drug transport in neurodegenerative diseases may be improved by nanoparticle formulations that contain therapeutics that target particular biochemical processes in the brain. Recent advancements in materials science and nanotechnology offer advanced materials with customized properties for targeted drug delivery. Research on the brain and BBB has led to the development of strategies for enhanced BBB crossing. Hybrid nanoparticles serve as a promising drug delivery vehicle which promotes the brain transport of drugs. This review discusses the structure, function, cells, and mechanisms of biotraficking across BBB. An emerging strategy for BBB crossing, a hybrid nanoparticle-based drug delivery system for brain delivery for various brain diseases like Alzheimer's, Parkinson's, Huntington's, Glioblastoma, Epilepsy, Schizophrenia, Traumatic Brain Injury, Migraine, and other neuroinflammatory disease like Krebs etc are discussed.

Link: <https://doi.org/10.1016/j.hybadv.2025.100513>



## TITLE:

Efficacy of Hippocampal Avoidance Whole Brain Radiotherapy to Preserve the Cognitive Functions among Brain Metastasis Patients: Systematic Review and Meta-analysis

## AUTHOR :

Surendran H.P.; Sah S.K.; Veeralakshmanan P.; Nair P.; Ashok H.P.; Unnikrishnan M.K.; Kalavagunta S.; Sasidharan A.; Chandran D.; Poornachary N.M.; Dutta D.

## JOURNAL NAME:

Neurology India (Vol.-73, Issue-3)

## DETAILS:

Published on May 2025



## ABSTRACT:

This systematic review and meta-analysis aims to gather credible sources of comprehensive information on the efficacy and radiation dose (maximum and minimum) to the hippocampus and contouring area to prevent cognitive dysfunction by hippocampal avoidance whole brain radiation therapy (HA-WBRT). This comprehensive review was conducted in compliance with PRISMA guidelines. The systematic literature search was performed across four databases including pubmed®, Scopus®, Cochrane Library®, and clinicaltrial.gov.in from inception until December 31, 2023. A total of nine eligible studies were selected encompassing a total of 680 patients with brain metastases who underwent radiation therapy. Notably, radiation exposure to the hippocampal area (3 to 7 mm margin) was avoided during whole-brain radiation therapy (WBRT). The maximum dose delivered to the hippocampus varied between 12.61 Gy and 17 Gy in different studies with minimum doses varying from 5.38 Gy to 10 Gy. HA-WBRT significantly preserves delayed recall compared to WBRT ( $p = <0.001$ ,  $P = <0.001$ ,  $<0.001$  and  $P = 0.048$ ), with an effect size (SMD: -0.57, 95% CI: -1.27, 0.12,  $P = 0.59$ ,  $I^2 = 0\%$ ) favoring HA-WBRT. However, the changes in psychomotor speed, visuospatial abilities, executive function, verbal fluency, and so on were not statistically significant between HA-WBRT and WBRT groups. This review underscores the significant positive impact of HA-WBRT in preventing radiation-induced neurocognitive dysfunction in brain metastatic patients, particularly in delayed recall. However, comprehensive cognitive preservation necessitates additional interventions alongside HA-WBRT.

Link: <https://doi.org/10.4103/neurol-india.neurol-india-d-24-00727>



## TITLE:

A Family of Neutrosophic Estimators for Estimating Mean: An Application to Real Data

## AUTHOR :

Singh B.; Singh A.; Smarandache F.

## JOURNAL NAME:

Sankhya B

## DETAILS:

Published on 19 June 2025



## ABSTRACT:

In the realm of sample survey research, the classical statistics approach primarily deals with precise and definitive types of data to estimate population parameters when additional information is available. However, this approach fails when faced with data indeterminacies. To address such ambiguities, neutrosophic statistics emerges as an extension of both fuzzy and classical statistics. Thus, in light of the challenges posed by indeterminacy in sampling, we have introduced a proficient neutrosophic class of estimators, with and without Searls technique (optimization tool) for estimating the mean utilizing additional (ancillary) information under neutrosophic simple random sampling (NeSRS). The expression for the Bias and mean square error (MSE) of propounded estimators are derived up to the first order of approximation. The primary objective of this manuscript is to attain optimal estimates using our proposed neutrosophic estimators for unknown population mean values, while minimizing MSE and maximizing relative efficiency (RE). We accomplish this through an extensive study utilizing neutrosophic real data and simulations.

Link: <http://dx.doi.org/10.1007/s13571-025-00369-9>



## TITLE:

Sustainable biogas purification techniques using indigenous materials: a review focused on developing economies

## AUTHOR :

Srivastava A.; Meena P.K.; Patane P.M.; Meena D.; Shelare S.; Wagle C.S.

## JOURNAL NAME:

Biofuels

## DETAILS:

Published on 15 June 2025



## ABSTRACT:

Environmental degradation and increasing dependence on fossil fuels underscore the urgent need for renewable and sustainable energy alternatives. Biogas is a promising solution, particularly for developing regions, aligning with Sustainable Development Goal 7 (clean and affordable energy). However, the presence of impurities such as carbon dioxide and hydrogen sulfide hampers its efficient utilization. This review aims to evaluate low-cost, locally available purification methods that enhance biogas quality while remaining feasible for small-scale applications. Various adsorbent materials and techniques were analyzed using natural clay, iron-rich soils, steel wool, and compost-based filters. The findings reveal that clay can remove up to 90% of contaminants, iron-rich soils up to 93.8%, steel wool up to 95%, and compost up to 80%. Additional strategies such as drying biomass ash, surface modification of activated carbon, material blending, and adsorbent reuse further improve purification efficiency. These insights demonstrate that sustainable, cost-effective biogas purification methods can significantly boost energy access, reduce fossil fuel dependence, and support environmental sustainability in developing economies.

Link: <https://doi.org/10.1080/17597269.2025.2517454>



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