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FACULTY PUBLICATION

RESEARCH PAPERS

August-2025

TITLE:

Influence of infill wall opening on seismic performance of irregular RC buildings by using adaptive pushover analysis

AUTHOR :

U.J., Patil, Udayraj Janardan; R.R., Kurlapkar, Rohit Rajendra; M.R., Shendkar, Mangeshkumar R.

JOURNAL NAME:

Journal of Building Pathology and Rehabilitation
(Vol.-11, Issue-1)

DETAILS:

Published on 29 July 2025



ABSTRACT:

This research undertakes a detailed seismic assessment of reinforced concrete (RC) frame structures incorporating unreinforced masonry (URM) infill walls with varying sizes of openings. The investigation involves the development and analysis of five distinct building configurations modelled using the strut-infill approach in alignment with ASCE 41–06 guidelines. These configurations include a fully infilled frame and four additional models with 12.80, 19.20, 29.60 and 40.00% infill wall openings, respectively. Structural layouts analysed comprise a symmetrical plan and three irregular forms are H-shaped, T-shaped, and Plus-shaped geometries. All models are subjected to seismic loading, and nonlinear static adaptive pushover analysis is performed using SeismoStruct software to capture their seismic response characteristics. The study specifically evaluates key design parameters such as base shear capacity, ductility factor, ductility reduction factor, overstrength factor, response reduction factor and the time period of buildings. The infill panels are modelled using equivalent strut formulations of the masonry infill. Response spectra from the Chi-Chi earthquake are used as seismic input to represent realistic ground motion in the adaptive pushover analysis. Plan irregularity and increased infill wall openings significantly influence the seismic performance parameters by reducing lateral strength and R factor of RC frame structures. Irregular configurations, especially T and Plus-shaped plans, exhibit more pronounced degradation in structural performance as infill discontinuity increases compared to symmetrical plan models.

Link: <http://dx.doi.org/10.1007/s41024-025-00681-x>





TITLE:

ViziAssist: Visual Assistance for Visually Impaired Drivers

AUTHOR :

K., Arya, Kanishk; M.S., Arya, Meenakshi
Sumeet; V., Deshmukh, Vedant; K., Dabade,
Ketaki

JOURNAL NAME:

Communications in Computer and Information
Science (Vol.- 2473 CCIS)

DETAILS:

Published on July 2025



ABSTRACT:

Visually impaired individuals face significant challenges in navigating the world, and driving, a crucial aspect of independent living, becomes particularly daunting. While autonomous vehicle technology holds promise, its widespread adoption and affordability for all remain distant realities. Addressing this pressing need, we present ViziAssist, an innovative visual assistance system specifically designed to empower visually impaired drivers. Utilizing an NVIDIA Jetson Nano at its core and leveraging the power of the YOLOv7 object detection model, ViziAssist offers real-time object detection and classification capabilities tailored for road scenarios. This paper details the system's architecture, the training methodology employing transfer learning on a custom dataset of Indian roads, and the implementation of an intuitive visual output mechanism using strategically placed LEDs. Rigorous testing procedures, encompassing both indoor and on-field evaluations, were conducted to assess the system's performance. ViziAssist achieved an impressive mean Average Precision (mAP) of 0.681, demonstrating its efficacy in real-time object detection. We achieved particularly high precision scores for crucial object classes like autorickshaws (0.799) and buses (0.8), highlighting the system's reliability in identifying potential hazards on Indian roads.

Link: http://dx.doi.org/10.1007/978-3-031-93688-3_6



TITLE:

Decentralized finance evolution: A comprehensive bibliometric analysis

AUTHOR :

R., Kumar, Roshan; S.K., Sharma, Shakti Kant;
K., Kishor, Kriti; P., Devi, Punam

JOURNAL NAME:

Sustainable Futures (Vol.-10)

DETAILS:

Published on 26 August 2025



ABSTRACT:

The swift advancement of technology has transformed numerous sectors, particularly the financial services business, with Decentralised Finance (DeFi) emerging as a notable disruptor. To guarantee the sustained development and integration of DeFi, it is necessary to investigate and comprehend the emerging trends in this field. This study presents a bibliometric analysis of 181 Decentralized Finance articles published from 2010 to 2024 in the Scopus database. The data were examined and illustrated utilising the VoS viewer platform and R software, yielding both descriptive and visual insights. Authored by 503 researchers across 418 universities, these works span 129 journals and cite 10,428 references. Publications show an annual growth rate of 29.2 %, with 2024 exhibiting unprecedented output. Frontiers in Blockchain leads with six publications, followed by the Journal of Risk and Financial Management. New Zealand tops the citation rankings, led by Auckland University with 338 citations. Bellavitis C. and Chen Y. are the most prolific authors each with 338 citations. The cluster analysis identifies six thematic areas, offering insights into various aspects of decentralized finance. This study offers critical insights for academics, policymakers, and industry practitioners by mapping DeFi's transition from conventional financial systems to decentralized ecosystems. The findings illuminate research gaps, propose future research avenues, and underscore the necessity of developing policies and cyber hygiene protocols to mitigate the risks of decentralized finance. This work thus serves as a valuable resource for advancing the discourse on DeFi and its implications for financial innovation.

Link: <https://doi.org/10.1016/j.sftr.2025.101209>



TITLE:

A review of in-vitro digestibility models on diverse foods in various segments of human digestive tract

AUTHOR :

B.S., Kiran, Basava Shiva; O., Bashir, Omar; P.A., Pawase, Prashant Anil; K.K., Dash, Kshirod Kumar; T.T., Amin, Tawheed T.; R., Shams, Rafeeya; A.M., Shaikh, Ayaz Mukarram; K., Béla, Kovács

JOURNAL NAME:

Discover Food (Vol.-5, Issue-1)

DETAILS:

Published on 19 August 2025



ABSTRACT:

In order to simulate the process of food digestion in the gastrointestinal (GI) tract, various in-vitro digestion models have been developed. These models vary from simple, single-compartment systems to more complex setups with multiple compartments and dynamic characteristics. In-vitro models have mostly been employed to analyze the structural changes and release of food components during digestion in different simulated gastrointestinal environments. The results obtained from in-vitro models of digestion differ significantly from those of in-vivo models because it is difficult to accurately replicate the highly intricate physiological and physiochemical processes occurring in the human digestive tract. The rate and location of food digestion in the gastrointestinal tract is considered very important for human health. However, this feat cannot often be realized for technical, ethical, or budgetary reasons. The significance of in-vitro models lies in their ability to provide reproducibility, the flexibility to select a controlled environment, and the simplicity of sampling. In-vitro models serve as valuable tools for conducting mechanistic investigations and testing hypotheses. This review provides a concise overview of in-vitro digestion models utilized for studying the digestion of different complex compounds that can predict the level of digestibility for a variety of foods. Digestibility models differ in predictability of digestibility. While some of them are designed more for controlled nutrient breakdown assessment, others more realistically mimic real life dynamic digestion.

Link: <https://doi.org/10.1007/s44187-025-00454-y>



TITLE:

Advancements in thermoacoustic technology: a comprehensive review and analysis of recent research

AUTHOR :

M.K., Gaikwad, Mahesh Krishna; S.U., Shinde, Savita Uday; A.L., Dandavate, Abhijit L.; M.J., Naidu, Mithul J.; T.A., Jadhav, Tushar Ankush; S.S., Salunkhe, Sachin S.; R., Čep, Robert

JOURNAL NAME:

International Journal of Air-Conditioning and Refrigeration (Vol.-33, Issue-1)

DETAILS:

Published on 12 August 2025



ABSTRACT:

Thermoacoustic technology attracts significant attention from researchers due to its high reliability, environmentally friendly operation, and less maintenance. An overview of related theoretical models for thermoacoustics technology is used in this review paper to support an introduction to the thermoacoustic effect. The outline of the latest research work in thermoacoustic engine technology and the experimental setup is presented. In addition to this, the paper discusses the numerical analysis of thermoacoustic power generator. The majority of the innovations have been covered in this review, with recent examples being the generation of electric power setups. Interpretation of nonlinear effects in thermoacoustic systems and the innovation of nonlinear thermoacoustics need to receive more attention. For both theoretical and engineering study, discussions on fluid flow and heat transfer under turbulent and oscillating flow conditions will be instructive. These prime movers are utilized to operate the thermoacoustic driven refrigerator, cryocooler, and also, used to generate electric power.

Link: <http://doi.org/10.1007/s44189-025-00081-3>



TITLE:

Prediction of anisotropic property of activated metal inert gas welding by employing different supervised machine learning models

AUTHOR :

R.U., Kakade, Ruturaj U.; N.K., Khedkar, Nitin K.; A.M., Dalavi, Amol Macchindra

JOURNAL NAME:

MethodsX (Vol.-15)

DETAILS:

Published on 26 July 2025



ABSTRACT:

Activated Metal Inert Gas (A-MIG) welding of EN10028 (SA516Gr70) steel was investigated using varying current, voltage, and gas flow rate to assess their influence on tensile strength (TS). A total of 100 welded samples were prepared and tested per ASTM standards. Material characterization was performed on samples with the highest and lowest TS to evaluate the correlation between microstructure and strength. Machine learning models Linear Regression, Random Forest Regression, and Support Vector Regression (SVR) were applied to predict TS based on welding parameters.

- The SVR model achieved the best predictive performance, with an R^2 of 0.8750 and a model accuracy of 96.73 %.
- The results confirm the potential of SVR for accurately forecasting TS in A-MIG welded EN10028, facilitating process optimization in pressure applications.

Link: <https://doi.org/10.1016/j.mex.2025.103514>





TITLE:

Comparative analysis of advanced bracing systems for lateral stability of RCC bridge bents under seismic excitation

AUTHOR :

H., Kadam, Harshwardhan; J., Patil, Jagruti; P., Minde, Pravin

JOURNAL NAME:

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

DETAILS:

Published on 11 April 2025



ABSTRACT:

This study investigates the effectiveness of energy dissipation devices in reducing seismic damage to large bridges, particularly focusing on buckling restrained braces (BRBs) and shape memory alloys (SMAs). Utilising SAP2000 software, the bridge models are designed with a displacement-based approach and subjected to three different ground motions to evaluate the performance of these devices in minimising lateral displacements and forces. The findings indicate that SMAs outperform BRBs due to their superior self-centring properties. While the primary focus is on BRBs and SMAs, viscous dampers (VDs) provide a valuable baseline for comparison. VDs serve as a well-established passive control system, highlighting the potential benefits of combining BRBs with VDs to enhance overall performance. The results reveal that bracing systems significantly reduce lateral deflection and force in the mid-upper sections of the piers compared to unbraced models. Specifically, BRBs reduce deflection by 30%, VDs by 40%, and SMAs by 50%. This comprehensive analysis underscores the importance of incorporating advanced bracing systems in bridge substructures to mitigate seismic impacts, offering insights for future research and the broader application of combined energy dissipation systems in bridge engineering.

Link: <http://dx.doi.org/10.1007/s41024-025-00613-9>



TITLE:

Environmental impact mitigation and durability enhancement of concrete through fly ash substitution: a comprehensive review

AUTHOR :

L., Gautam, Lilesh; M.K., Purbe, Mukesh Kumar; K.V., Sharma, Kul Vaibhav; C., Kumar, Chandan; P.P., Kalita, Priyank Pankhi

JOURNAL NAME:

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

DETAILS:

Published on 7 April 2025



ABSTRACT:

Cement is the fundamental ingredient in concrete, a widely utilized material in construction. Cement production is responsible for nearly 8% of global carbon emissions, creating an urgent need for sustainable alternatives. Cement production and use significantly raises environmental issues due to greenhouse gas emissions. Cement manufacturing emits a considerable quantity of carbon dioxide as one of the primary contributors to greenhouse gases. Fly ash (FA) is a residual material from coal combustion and is abundant in silica and alumina. Researchers have replaced cement with FA in different amounts to reduce the impact of sulfate attacks, carbon emissions, and durability issues. FA incorporated into concrete improves its characteristics by facilitating pozzolanic reactions. Fly ash as a cement replacer material has gained more popularity in the construction market with the attention of researchers and scientists. This review paper investigates the application of FA in concrete, focusing on its potential to reduce environmental impacts while improving mechanical and durability properties. The study highlights the effects of FA on the compressive and split tensile strengths of concrete, underscoring its role as a viable, eco-friendly alternative in modern construction practices. The findings of this paper are particularly relevant for large-scale infrastructure projects seeking to achieve sustainability goals without compromising strength and durability. This review uniquely explores the simultaneous benefits of FA in reducing environmental impact and enhancing concrete performance, distinguishing it from existing literature.

.Link: <http://dx.doi.org/10.1007/s41024-025-00609-5>



TITLE:

Exploring the versatility of Magnetic Relaxation Switching (MRS) and CRISPR-based biosensors for the detection of foodborne pathogens; a comprehensive review

1

AUTHOR :

H., Borah, Hiya; O., Bashir, Omar; P.A., Pawase, Prashant Anil; I.H., Mondal, Imdadul Hoque; S., Varallyay, Szilvia; D., Ungai, Diána; B., Kovács, Béla

JOURNAL NAME:

Applied Food Research (Vol-5, Issue-2)

DETAILS:

Published on July 2025



ABSTRACT:

Food-borne pathogens such as *E. coli.*, *Salmonella*, *Listeria monocytogenes*, *Campylobacter jejuni* are the common ones that pose a significant threat to human health and therefore require quick accurate affordable detection of food pathogens. Traditional pathogen identification procedures in foods are laborious and expensive and require specialized equipments. Magnetic Relaxation Switching (MRS) biosensors, which work by monitoring changes on dispersion, aggregation, or concentration change of magnetic nanoparticle (MNPs), have emerged as an potential alternative. Therefore, MNPs have gained wide applications due to the typical magnetic properties that may efficiently enhance the target, separate, and capture with high sensitivity. However, traditional MRS biosensors are often insensitive and unstable. The review, therefore, focuses on the latest development of CRISPR-Cas12a-assisted MRS biosensors for improving food safety monitoring. The CRISPR-Cas12a system enhances pathogen detection by recognizing and cleaving target sequence with high precision. Lastly, the review sums up the improvements of different biosensors in comparison with conventional biosensors and shows the use of MNPs in the identification process of various pathogens.

Link: <https://doi.org/10.1016/j.afres.2025.101190>



TITLE:

Structural, functional characteristics and diverse applications of galactomannans: A comprehensive review

AUTHOR :

N., Sharma, Nikhil; O., Bashir, Omar; P.A., Pawase, Prashant Anil; S.S., Gaur, Supriya S.; T.T., Amin, Tawheed T.

JOURNAL NAME:

Carbohydrate Research (Vol.-556)

DETAILS:

Published on July 2025



ABSTRACT:

Galactomannans (GMs) are regarded as natural and abundantly found polysaccharides in legumes with multidimensional applications in food processing. GMs have a chemical structure comprised of beta-(1–4) -mannose, or mannose, and a single unit of galactose side chain connected through an alpha –1,6-glycosidic bond at different intervals in the linear structural arrangement. Some GMs also contain glucose units in their structure viz. modified galactomammans, GMs from fenugreek etc. GMs find potential applications in food, pharmaceutical, biomedical and cosmetic industries due to their excellent thickening, stabilizing, emulsifying, binding, and gelling properties. Furthermore, GMs are used in beverages, dairy, and meat-based products due to their beneficial effects on bioavailability, protection against degradation, and reduced adverse effects. Moreover, drug delivery, additive modification, and nanoformulation are some of their potential applications. These are non-toxic and cost-effective due to their derivation from renewable sources and exhibit biodegradable, biocompatible, antimicrobial, and antioxidant properties. Researchers have recently focused on utilizing GMs as a promising material for synthesizing nanomaterials and formulations to deliver pharmaceutical and bioactive components effectively. The review, therefore, discusses structural and functional properties of GMs and their extraction methodologies for potential industrial applications.

Link: <https://doi.org/10.1016/j.carres.2025.109627>



TITLE:

Sericin-based nanotherapeutics: A dual-action biological macromolecule for anti-urolithiatic and antibacterial applications

AUTHOR :

M.S., Salvi, Monal S.; S., Vairale, Shiva; M.R., Bhalerao, Minal R.; C.S., Mote, Chandrashekhar S.; A.T., Pawar, Anil T.; C., Chowdhury, Chiranjit; S.B., Agawane, Sachin Bharat

JOURNAL NAME:

International Journal of Biological Macromolecules (Vol.-322)

DETAILS:

Published on August 2025



ABSTRACT:

Kidney stone (urolithiasis) is a prevalent global health issue with limited safe and cost-effective treatment options. This study investigates the anti-urolithiasis potential of sericin, a silk protein sustainably extracted from *Bombyx mori* cocoons, and its innovative nanoparticle formulations. Biocompatible sericin, sericin nanoparticles, and sericin coupled with a phytate chelator were developed and meticulously characterized. In vitro assays, sericin modified with phytate demonstrated the most potent antioxidant activity (IC₅₀: 39.5 µg/mL) and the highest calcium oxalate stone inhibition (~92 %, IC₅₀: 30.1 µg/mL). It also exhibited significant antibacterial activity against *E. coli*, *S. aureus*, *K. pneumoniae*, and uropathogenic *E. coli*. In-vivo studies revealed improvements in urinary, blood, and serum parameters, reduced renal crystal size, and absence of tissue toxicity, as confirmed by histopathological analysis. This is the first report demonstrating sericin's efficacy in the prevention and treatment of urolithiasis in a rat model. Sericin nanoparticles, especially those crosslinked with phytate (PASS-NP), effectively crossed the compromised glomerular filtration barrier, localized in renal tubules, and disrupted calcium oxalate crystallization. The enhanced activity is attributed to the synergistic effects of sericin's antioxidant, anti-inflammatory, and antibacterial properties, and phytate's calcium-chelating and permeability-enhancing role. PASS-NP treatment showed significant crystal dissolution, reduced hematological disturbances, improved renal biomarkers, and strong antibacterial action against stone-promoting pathogens. These findings position sericin-based nanoparticles as multifunctional, biocompatible therapeutic agents offering a minimally invasive, eco-friendly, and cost-effective strategy for urolithiasis management potentially reducing drug load, recurrence, and healthcare costs.

Link: <https://doi.org/10.1016/j.ijbiomac.2025.146763>



TITLE:

Current drug targets for the treatment of depression

AUTHOR :

G., Pathak, Gauri; A., Nigade, Aryaa; K., Anitha, Kuttiappan; S., Bhatt, Shvetank

JOURNAL NAME:

Brain Disorders (Vol.-19)

DETAILS:

Published on August 2025



ABSTRACT:

Depression or major depressive disorder (MDD) is a condition of prolonged sadness, which requires crucial examination. Worldwide, 5 % of the adult population is suffered with depression. According to the World Health Organization (WHO) data, women are more prone to affect with depression as compared to men. There is no effective treatment available for the MDD. Available treatment options such as tricyclic antidepressants (TCAs), selective serotonin reuptake inhibitors (SSRIs) and selective norepinephrine reuptake inhibitors (SNRIs) are facing problems of treatment resistance and onset of action of above-mentioned drugs are slow and start showing their effects after 4–6 weeks. Now, the discovery of antidepressants is going on beyond monoaminergic transmission and recently approved drugs targets glutaminergic and GABAergic transmission. Moreover, serotonergic and dopaminergic transmission at multiple receptor levels and uptake mechanisms, melatonin agonists, neuropeptides, neurokinins etc. are also approved or in the various phases of clinical trials for MDD. This paper mainly discusses the recent advances in the treatment of depression i.e. drugs and novel targets which are recently approved or evaluated in preclinical and clinical setups. It also highlights the need for innovative treatments due to limitations in the current therapies and emphasises on novel drug targets beyond the traditional treatment plans, which might lead to increase in effectiveness and faster relief from symptoms.

Link: <https://doi.org/10.1016/j.dscb.2025.100270>



TITLE:

Renewable energy cost, policy and market in
Asia pacific region

AUTHOR :

N.N., Dalei, Narendra N.; S.R., Balabantaray,
Subhra Rajat; A., Rawat, Atul

JOURNAL NAME:

Renewable Energy Cost, Policy and Market in
Asia Pacific Region (Book chapter)

DETAILS:

Published on 2025



ABSTRACT:

Energy security plays a major role in ensuring economic growth. Traditionally, fossil fuels, which comprise coal, petroleum products and natural gas, have been the dominant sources of energy and considered to be economic growth drivers for generations. The increased reliance on the traditional forms of energy has increased the threat of climate change, energy poverty and price fluctuations. These issues have forced countries and leading institutions to enhance the usage of renewable sources of energy. Therefore, this study examines the renewable energy market with resulting challenges and opportunities in the Asia Pacific region. The study observed that CO₂ emissions increased to 16.75 billion metric tonnes in 2020 in the Asia Pacific region, resulting in an immense global temperature rise. Hence, the Asia-Pacific Economic Cooperation economies need to design effective renewable energy policies for a speedy transition to a low-carbon economy while addressing associated challenges and availing new opportunities.

Link:

<https://www.taylorfrancis.com/chapters/edit/10.4324/9781003253419-4/renewable-energy-cost-policy-market-asia-pacific-region-narendra-dalei-subhra-rajat-balabantaray-atul-rawat?context=ubx&refId=940546de-7362-474f-b959-c64bdbb26846>



TITLE:

Dinuclear aluminum complex as an active material for RRAM switching devices

AUTHOR :

V., Sharma, Vivek; A., Chetia, Anupam; M., Majumder, Moumita; P., Lama, Prem; S., Sahu, Satyajit; R.K., Metre, Ramesh K.

JOURNAL NAME:

Dalton Transactions (Vol.-
, Issue-

DETAILS:

Published on June 2025



ABSTRACT:

In this study, we report the synthesis and structural characterization of dinuclear aluminum complex 1, containing redox-active bis-catecholaldimine ligand 6,6'-{[ethane-1,2-diylbis(azanylidene)]bis(methanylidene)}-bis(3,5-di-tert-butyl-1,2-dihydroxybenzene) (LH4). Complex 1 was readily obtained by refluxing LH4 and $\text{Al}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$ in 3:2 molar ratio in the presence of triethylamine in a methanolic solution. Single-crystal X-ray diffraction analysis of complex 1 showed that catecholaldimine ligands bound via octahedral coordination to each of the two Al(III) centers. Out of three, two ligands coordinated in a salen N_2O_2 fashion, providing four coordinating sites, while the third ligand acted as a bridged ligand, binding through its two catecholate oxygen atoms to each of the two Al(III) centers. Complex 1 was also further characterized using various techniques, such as HRMS, FTIR spectroscopy, TGA and CHN analysis. Electrochemical characterization of complex 1 was performed using cyclic voltammetry in a DCM solution, which showed several quasi-reversible and irreversible oxidation–reduction peaks. The lipophilic aluminum complex 1 was further employed as an active material to fabricate a resistive switching memory device, ITO/complex 1/Ag, and it was characterized using a write-read-erase-read cycle. Interestingly, the device showed stable current–voltage characteristics, excellent endurance stability and analog switching between two different resistance states for 5000 s, making it a viable option for long-term data storage applications. The frontier molecular orbital energy of complex 1 was calculated using density functional theory, where it was observed that the hole injection was favourable during the conduction mechanism of the memory device

Link: <http://dx.doi.org/10.1039/d5dt01524c>



TITLE:

Unravelling Anti-Glycation, Anti-Amyloid, Anti-Inflammatory, and Antioxidant Properties of Selected Medicinal Plant Extracts: A Multifaceted Novel Anti-Aging Approach

AUTHOR :

N.S., Bangar, Nilima S.; A., Ganapathy A, Anand; K.M., Al-Anazi, Khalid Mashay; M.A., Farah, Mohammad Abul; W.A.Q., Hailan, Waleed Ali Qaid; A.A., Frolov, Andrej A.; B., Roy, Bishnudeo; A.A., Vaidya, Anuradha A.; A., Kumar, Alaganandam; P.S., Tuna, Rashmi

JOURNAL NAME:

Natural Product Communications (Vol.-20, Issue-8)

DETAILS:

Published on 12 August 2025



ABSTRACT:

Objective This study investigates how hydroalcoholic and ethanolic extracts from *Angelica sinensis* (Oliv.) Diels, *Nelumbo nucifera* Gaertner, *Coccinia indica* Wight & Arn, *Syzygium jambolanum* (Lam.) DC, *Cardiospermum helicacabum* L, and *Solanum trilobatum* L impact the glycation, Amyloid β ($A\beta$) aggregation, inflammation, and oxidative stress—processes central to age-related disorders. **Methodology** Using spectrofluorimetric and Thioflavin T fluorescence tests, the activity of plant extracts (ethanolic and hydroalcoholic) on albumin glycation and $A\beta$ 25-35 self-aggregation was examined. To comprehend the effects of plant extracts on inflammation, macrophages were subjected to plant extract treatment and, subsequently assessed for, cell viability, cytokine production (TNF- α , IL-6, and IL-10), and nitric oxide generation using XTT assay, ELISA, and nitric oxide estimation kit, respectively. Additionally, the DPPH and ABTS assays were used to evaluate the plant extracts capacity to scavenge radicals, and the total phenolic content was determined. **Results** Among the 12 plant extracts examined, *S. trilobatum* hydroalcoholic (Sth) extracts significantly reduced the three AGEs content (Malondialdehyde, pentosidine, and crossline) as compared to glycated BSA ($p < 0.0001$). Moreover, *A. sinensis* hydroalcoholic (Ash) extracts inhibited the self-aggregation of $A\beta$ 25-35 fragments by 87%, exhibiting significant anti-amyloid activity and a possible function in preventing protein aggregation linked to neurodegenerative conditions like Alzheimer's disease (AD). Meanwhile, *C. indica* hydroalcoholic (Cih) extracts displayed substantial anti-inflammatory activity by maintaining the cell viability and reducing the pro-inflammatory cytokine and nitric oxide production, highlighting their potential to control inflammation, a significant factor in age-related diseases.

Link: <https://doi.org/10.1177/1934578X251363375>



TITLE:

Tailoring electrospun polylactic acid nanofibers for sustained drug release and controlled delivery applications

AUTHOR :

A., Gupta, Anshuman; V., Gholap, Vishwanath;
K., Balasubramanian, Kandasubramanian

JOURNAL NAME:

Journal of Polymer Research (Vol.-32, Issue-8)

DETAILS:

Published on August 2025



ABSTRACT:

The demand for sustainable drug delivery systems has driven research into biodegradable polymers with improved performance characteristics. Polylactic acid (PLA), a biocompatible and FDA-approved polymer, holds promise in biomedical applications but is limited by slow degradation rates and insufficient antimicrobial activity. This study develops electrospun PLA nanofibers infused with Tulsi (*Ocimum sanctum*) essential oil to improve sustained drug release, antimicrobial activity, and biodegradability. Physicochemical properties analyzed using Fourier Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscopy (SEM), and contact angle measurements revealed smooth morphology and increased hydrophobicity (88.4°). Drug release kinetics modeled using Korsmeyer-Peppas equations indicated a diffusion-controlled mechanism with R^2 value of 0.8022, enabling sustained release over 30 days. The nanofibers exhibited antibacterial efficacy against *Escherichia coli* and *Staphylococcus aureus* with inhibition zones of 1.2 cm and antifungal activity against *Aspergillus niger* with zones up to 1.0 cm. Degradation studies revealed accelerated biodegradation, with 81.4% weight loss in 30 days under simulated environmental conditions. These results showcase the multifunctional performance of Tulsi-infused PLA nanofibers, offering sustained drug release, antimicrobial activity, and eco-friendly degradation. This study highlights their potential for biomedical applications, such as wound dressings and antimicrobial coatings, while paving the way for advanced polymer systems and dual-drug delivery strategies. The graphical abstract depicts the synthesis of electrospun polylactic acid (PLA) nanofibers functionalized with Tulsi essential oil. Starting from PLA pellets, the electrospinning process yields nanofibers with enhanced antimicrobial activity and sustained drug release properties. Fourier-transform infrared (FTIR) spectroscopy confirms the successful encapsulation of Germacrene D.

Link: <http://dx.doi.org/10.1007/s10965-025-04521-x>





TITLE:

Enhanced autonomous water garbage collection system using deep learning-based object detection and path planning

AUTHOR :

P., Dubey, Parul; T.T., Bhagat, Titiksha Tulsidas; A.S., Kokare, Abhijeet Shrikrishna; P., Dubey, Pushkar; P.R., Chaudhari, Poonam R.; U.K., Raut, Umesh K.

JOURNAL NAME:

Bulletin of Electrical Engineering and Informatics
(Vol.-14, Issue-4)

DETAILS:

Published on August 2025



ABSTRACT:

Water pollution, particularly from floating debris such as plastics, has become a critical environmental issue, threatening aquatic ecosystems and biodiversity. Autonomous solutions for the detection and removal of waste are increasingly essential for maintaining water cleanliness and mitigating pollution. However, existing systems face limitations in real-time detection, accuracy, and adaptability to diverse aquatic environments. This paper utilizes the water pollution images dataset, comprising almost 300 high-resolution images from lakes, rivers, and coastal areas, representing various types of floating waste under different environmental conditions. In response to these challenges, this paper introduces an autonomous unmanned surface vehicle (USV) system equipped with the enhanced waste detection network (EWD-Net). EWD-Net improves upon traditional single-shot detection algorithms by integrating deeper feature extraction layers and enhancing computational efficiency, resulting in higher accuracy and faster detection. Additionally, the system includes the dynamic path optimization (DPO) module for efficient navigation and obstacle avoidance in complex water environments. The novelty of this system lies in its dual approach, combining advanced detection with optimized path planning, ensuring effective autonomous operation. The results indicate that the proposed model achieves an accuracy of 94.6%, outperforming existing algorithms and providing a robust solution for real-time waste detection and collection.

Link: <https://doi.org/10.11591/eei.v14i4.9399>



TITLE:

A Performance Comparison of Object Detection Algorithms on Traffic Scenes in Indian Roads

AUTHOR :

B.A., Paranjape, Bhakti Amogh; A.A., Naik, Apurva Abhijit; S.P., Sankar, S. Perumal

JOURNAL NAME:

Engineering, Technology and Applied Science Research (Vol.-15, Issue-4)

DETAILS:

Published on June 2025



ABSTRACT:

Machine learning-based object detection allows machines to decipher visual information and recognize objects in digital images or videos using localization and classification techniques. This study focuses on applying object detection techniques to traffic images from Indian roads, which are unstructured and have complicated traffic patterns. Taking into account the high number of traffic accidents in India, it is imperative to develop intelligent systems for traffic analysis and management. This study uses four cutting-edge object detection algorithms, SSD, YOLO, Faster R-CNN, and CenterNet, previously trained on the popular COCO and PASCAL VOC datasets. These algorithms are tested on the DATS dataset, created to represent road conditions in India, to examine the capacity of these models to manage the complexities of Indian traffic situations. In terms of mAP, the results show that CenterNet had the lowest score (69.5%) and YOLOv3 the highest (81.5%).

Link: <https://doi.org/10.48084/etasr.11105>



TITLE:

Image Watermarking for Tamper Correction
Based on Hamming Error Correcting Code

AUTHOR :

P.L., Rao, Pinapati Lakshmana; R., Sonar,
Reshma; N., Boddu, Nanditha; A., Pradhan,
Anita; R.K., Senapati, Ranjan K.; G., Swain,
Gandharba

JOURNAL NAME:

Engineering, Technology and Applied Science
Research (Vol.-15, Issue-4)

DETAILS:

Published on June 2025



ABSTRACT:

Watermarking techniques are designed to embed a watermark in a manner that enables precise detection of tampering at the receiver side. This article presents an image watermarking and tamper detection technique based on a modified Hamming code. The watermarking process is applied to each individual pixel of the gray image, with each pixel is represented using 8 bits. The 4 higher plane bits of a pixel are designated as data bits, and based on these, 3 redundant bits are computed. These 3 redundant bits are then modified using a Logistic Map (LM). Furthermore, based on the 4 data bits and 3 modified redundant bits, a parity bit is computed. The 3 modified redundant bits along with the parity bit form the Watermark Bits (WBs), which are embedded into the Least Significant Bit (LSB) positions of the pixel. This process results in a watermarked pixel. In the event that a single bit is tampered with, it can be easily identified and corrected at the receiver according to the detection and correction logic. The Hiding Capacity (HC) is 4 bits per pixel, and the distortion measure is 31 dB. Although the similarity index is reduced the accuracy of tamper detection is significantly improved.

Link: <https://doi.org/10.48084/etasr.11632>





TITLE:

How Mobile E-Commerce is Revolutionizing Marketing Strategies for Indian MSMEs

AUTHOR :

A., Kumar, Anuj; G.S., Bapat, Gautam Surendra;
K., Tiwari, Kavita; T.N., Hashem, Tareq N.; A.D.,
Rroy, Aruna Dev

JOURNAL NAME:

International Journal of Interactive Mobile
Technologies (Vol.-19, Issue-14)

DETAILS:

Published on July 2025



ABSTRACT:

This paper presents a multi-theoretical framework to explain how mobile e-commerce is revolutionising marketing strategies among Indian Micro, Small, and Medium Enterprises (MSMEs). By integrating mobile affordance theory, service-dominant logic (S-D logic), and the customer engagement cycle (CEC), the framework addresses the limitations of traditional adoption models like technology acceptance model (TAM), unified theory of acceptance and use of technology (UTAUT), and diffusion of innovation (DOI) in capturing strategic, experiential, and customer-centric dynamics. The study highlights how MSMEs employ mobile affordances such as push notifications, unified payments interface (UPI) payments, chatbots, and WhatsApp business APIs to co-create value and engage customers across awareness, acquisition, retention, and advocacy phases. National-level policies, such as digital India, UPI and open network for digital commerce (ONDC), have strengthened infrastructure and availability which in return catalysed the growth of mobile technology. The model provides MSME with direction to utilise mobile technologies, not only to survive but also to create sustainable value and compete successfully. It also has the potential to inspire future empirical research by presenting a conceptual framework that can be used to build new emerging market strategies focused on digitalisation.

Link: <https://doi.org/10.3991/ijim.v19i14.56851>





TITLE:

Gendered Media and Effectiveness of India's
Legislative Response

AUTHOR :

A.M., Chakravorty, Aditi Mukherjee; T., Tripathi,
Tarun; H., Thareja, Himani

JOURNAL NAME:

Economic and Political Weekly (vol.-60, Issue-
30)

DETAILS:

Published on 26 July 2025



ABSTRACT:

Media, being a significant agent of socialisation and technological development, have a pivotal role in crafting cultural understandings of gender. In the era of the digital age, the convergence of media and technology has not only escalated the commodification of women's bodies but also sustained entrenched patriarchal discourses, strengthening gender inequalities in social, political, and cultural contexts. This work provides a feminist legal analysis of the trend of self-objectification in international digital culture, with reference to India's disjointed and ineffective legislative framework. Although international organizations time and again raised objectification as a form of violation of women's rights, India has not yet implemented a specific law on objectification of women in media. This work examines critically prevailing Indian legislations and codes, pointing out their loopholes and limited enforceability. Moreover, this work also, contends that there is an imperative to legally define and control objectification in the media via statutory reform, enforceable standards, and constitutional interpretation on the basis of the guarantee of dignity under the Preamble. It calls for a shift in paradigm towards substantive gender equality and resists the existing practice of self-regulation in favor of robust, rights-based legislative intervention.

Link: <https://doi.org/10.71279/epw.v60i30.38239>



TITLE:

Investigating Associative Relationships between
Green Manufacturing and Sustainable
Manufacturing Enablers in Context to Indian
Manufacturing Industry

AUTHOR :

M.A., Rehman, Minhaj Ahemad; D., Seth, Dinesh

JOURNAL NAME:

Journal of Scientific and Industrial Research
(Vol.-84, Issue-7)

DETAILS:

Published on 25 July 2025



ABSTRACT:

The mounting challenge of net zero by 2070, towards responsible and eco-friendly business practices has led corporates, industry-houses, and lawmakers to increasingly adopt Green Manufacturing (GM) and Sustainable Manufacturing (SM). Typically, these terms are employed interchangeably, but in reality, terms are distinct but are closely associated. The associative relationships between GM and SM need to be demystified by addressing applicable enablers in context of developing economies like India. Existing research does not adequately deal with the associations between GM and SM, creating a critical gap. By methodically recognizing and assessing the enablers and establishing the connection between the two, this study aims to bridge this gap in the context of the Indian manufacturing sector. By developing a structured model cum roadmap and offering meaningful comparisons, this research provides strategic insights to help researchers, corporates, and policymakers to address relationships between the two. The research findings are expected to facilitate navigational requirements for the GM and SM implementation. It is expected that the study will facilitate scholars and business experts opening the door for new applications in line with SDG7 (affordable and clean energy) and SDG13 (climate action).

Link: <https://doi.org/10.56042/jsir.v84i7.4849>



TITLE:

New product development process: A conceptual framework for automobile industries

AUTHOR :

B.G., Shinde, Balasaheb G.; S.B., Sanap, Sudarshan B.; S.S., Pawar, Sachin S.; V.D., Wakchaure, Vishnu D.

JOURNAL NAME:

International Journal of Systematic Innovation
(Vol.-9, Issue-3)

DETAILS:

Published on June 2025



ABSTRACT:

India is emerging as a key destination for global automobile makers, prompting businesses to improve their abilities in product design and development to grow within the technology-focused automobile sector. Managing new product development (NPD) poses significant challenges within the dynamics to remain competitive. A well-defined and proven NPD process in the automobile industry results in high-quality, cost-effective, and timely product delivery to the market. Various frameworks have been proposed in the literature, and limitations highlight the need for a more flexible, integrated, and adaptive NPD model. Utilizing Cooper's highly efficient Stage-Gate framework, this research proposes a new NPD process framework to enhance the performance of the automobile industry. Based on the limitations of existing stages and gates used and a survey among the NPD professionals, detailed activities of the stages and associated gates have been presented.

Link: [https://doi.org/10.6977/IJoSI.202506_9\(3\).0004](https://doi.org/10.6977/IJoSI.202506_9(3).0004)





TITLE:

Role of faculty in credit transfer and mapping in higher education

AUTHOR :

S., Kulkarni, Siddhivinayak

JOURNAL NAME:

Student-Centric Policies in Higher Education:
TEAMS Model and Other Solutions

DETAILS:

Published on July 2025



ABSTRACT:

The role of faculty in transfer credit mapping is critical to ensuring that students' academic progress is recognized and preserved as they move between higher education institutions. Faculty are key decision-makers in evaluating the equivalency of external coursework, aligning curricula, and maintaining academic standards. This chapter explores the multifaceted responsibilities of faculty in the credit transfer process, including curriculum evaluation, quality assurance, inter-institutional collaboration, and student advising. It examines how faculty assess course content, learning outcomes, and academic rigor to determine credit equivalency, while also supporting students in navigating complex credit transfer policies. The chapter analyzes successful models of credit transfer systems, such as articulation agreements in the United States and the European Credit Transfer and Accumulation System (ECTS), highlighting best practices that streamline credit recognition and minimize credit loss. The role of faculty in transfer credit mapping is crucial for students' academic progress.

Link: <http://dx.doi.org/10.4018/979-8-3693-7635-5.ch006>



TITLE:

Case studies and clinical applications of AI in imaging

AUTHOR :

R., Beohar, Rasika; D.V., Purandare, Dishank V.;
S., Bhoite, Sachin; D., Polshettiwar, Dhanshree;
P.A., Satish, Polshettiwar Arunrao

JOURNAL NAME:

AI in Diagnostic Radiology: Clinical Applications
and Case-Based Insights

DETAILS:

Published on July 2025



ABSTRACT:

AI is revolutionizing medical imaging by enhancing diagnostic accuracy, efficiency, and personalized care. This chapter explores AI's clinical applications through case studies in radiology, neurology, cardiology, and ophthalmology, showcasing its role in early disease detection, risk stratification, and treatment optimization. Key applications include deep learning for breast cancer screening, AI-assisted stroke detection, and tumor segmentation. Challenges such as data quality, model interpretability, bias, ethics, and regulatory compliance are addressed. Emerging trends like federated learning, synthetic data, and explainable AI are highlighted. The chapter underscores the need for interdisciplinary collaboration, research, and standardization to maximize AI's impact on medical imaging and patient care.

Link: <http://dx.doi.org/10.4018/979-8-3373-5801-7.ch009>



TITLE:

Single-crystal ultrasound transducer for cancellous bone health assessment: A k-wave simulation approach

AUTHOR :

K.D., Kale, Kiran Dhanaji; A.A., Naik, Apurva Abhijit

JOURNAL NAME:

International Journal of Advanced Technology and Engineering Exploration (Vol.-12, Issue-128)

DETAILS:

Published on July 2025



ABSTRACT:

In recent decades, ultrasound-based analysis of cancellous bone health has emerged as an affordable and reliable alternative to ionizing radiation-based methods for estimating bone health parameters. The ultrasound probe plays a crucial role in evaluating various parameters of cancellous bone health. A single-crystal element transducer probe was proposed for estimating cancellous bone health parameters. The proposed method utilizes the k-space pseudo-spectral simulation technique available in the k-Wave toolbox. Three-dimensional (3D) cancellous bone phantoms representing healthy and osteoporotic bone samples from the human heel, sacrum, C2, and L3 vertebrae are constructed using 3D reconstruction techniques. Key cancellous bone health parameters, namely time of flight (ToF) and received signal strength, are computed using the k-Wave toolbox. The results demonstrate that the proposed method achieves performance comparable to multi-crystal element transducer-based techniques. Furthermore, the proposed approach has the potential to significantly reduce implementation costs for commercial applications.

Link:

<https://accentsjournals.org/paperinfo.php?journalPaperId=1814>





TITLE:

Combating misinformation, disinformation, and fake news: A comparative study of the USA, UK, and India

AUTHOR :

P., Pallav, Pallav; S.M., Aamir Ali, S. M.; A., Ghose, Anuttama

JOURNAL NAME:

Combatting Misinformation and Global Nation's False Narratives Through Education

DETAILS:

Published on June 2025



ABSTRACT:

The role of digital media in disseminating information has attained a prominent position in society. Though social media and other platforms promise a democratic space, in reality, it has been an easy ground for powerful entities with resources to sow the seeds of propaganda with the help of manipulated information. The dominance of incorrect information in the form of misinformation, disinformation, and fake news is evident. This chapter analyses the scenario of the UK and the USA in brief, with a primary focus on India, which has been the nucleus of the informational crisis, palpable during elections, COVID-19, and in general. Further, the paper attempts to identify the factors that flare up the menace of misinformation, disinformation and fake news on social media. Finally, it delves into the scope of its regulation and attempts to produce possible effective countermeasures to tackle incorrect information on social media.

Link: <http://dx.doi.org/10.4018/979-8-3693-9601-8.ch008>



TITLE:

The intersection of virtual currencies and green finance: A sustainable development perspective

AUTHOR :

R., Kumar, Roshan; Vaibhav; S., Yadav,
Sandeep; F., Haque, Faizul

JOURNAL NAME:

Sustainable Service Marketing with Virtual
Currencies

DETAILS:

Published on June 2025



ABSTRACT:

Examining the interplay between virtual currencies and green finance in promoting sustainable development is more crucial as the global economy confronts digital revolution and climate change. This study fulfills that need by offering a comprehensive bibliometric analysis of published works on virtual currency and green finance from 2020 to 2025. The study examines publication trends, prominent authors, and thematic patterns through performance analysis and scientific mapping techniques utilizing VOSviewer and Excel. The results indicate a rapid increase in scholarly output, significantly driven by substantial contributions from China, India, and the United Kingdom. Thematic evolution reveals emerging trends in distributed finance (DeFi), sustainability, and blockchain-based green innovation. The study presents policy recommendations for integrating blockchain-based virtual currencies into environmental finance systems and explores the theoretical implications of linking virtual financial technologies with green economic models.

Link: <http://dx.doi.org/10.4018/979-8-3373-0315-4.ch011>





TITLE:

Empowering sustainable innovation: How servant leadership drives innovation in india's tourism sector

AUTHOR :

S., Srivastava, Sachitaa; P., Thakur, Pratibha; K., Gaurav, Kunal; A.S., Ray, Aishwarya Suraj; M., Mahato, Madhuri

JOURNAL NAME:

Empowering Sustainable Performance and Competitive Advantage in Tourism

DETAILS:

Published on June 2025



ABSTRACT:

This study examines the link between servant leadership and employee outcomes, focusing on innovative work behavior and workplace thriving, with knowledge sharing as a mediating factor, using social exchange theory. Surveying 359 hotel employees across Delhi-NCR, Himachal Pradesh, Haryana, Punjab, and Jammu & Kashmir through a two-wave method, data were analyzed via PLS-SEM using SmartPLS software. The results reveal that servant leadership significantly influences innovative work behavior and thriving, while knowledge sharing directly enhances these outcomes and mediates their relationship with servant leadership. This highlights the role of servant leadership in fostering a culture of reciprocity and knowledge exchange to promote well-being and innovation. Organizations should adopt servant leadership practices and encourage knowledge sharing through collaborative tools and incentives. By applying a social exchange perspective, this study advances understanding of leadership's role in driving innovation and employee engagement within India's dynamic hospitality sector.

Link: <http://dx.doi.org/10.4018/979-8-3373-4546-8.ch007>



TITLE:

Synergistic mechanisms of fly ash reinforcement on the mechanical characteristics, deformation behaviour, grain refinement, and grain boundary in friction stir processed copper matrix composites

AUTHOR :

H.M.A., Kumar, Harikishor M.Anil; R.V., Prasad, R. V.; P.M., Kumar, Parshant Madhan; I.S.P., Sushma, I. Sri Phani; B., Yelamasetti, Balram; S.D., Shelare, Sagar D.; S.S., Sharma, S. Sh; A.I., Ismail, Abdelaziz I.; J.V., Lozanović, Jasmina V.

JOURNAL NAME:

Journal of Materials Research and Technology
(Vol.-36)

DETAILS:

Published on June 2025



ABSTRACT:

Fly ash is an attractive reinforcement for copper and its alloys. It is a by-product produced from the combustion of coal in thermal power plant. This solid waste produced massively across the globe is considered as a serious threat to the environment. Researchers across the globes are looking for its utilization. Copper matrix composites reinforced with fly ash instead of costly hard ceramics are one of those applications. However, it is technically challenging to incorporate fly ash in copper matrix uniformly and homogeneously via liquid-based processing techniques due to large density gradient. In the present study, efforts are being put to fabricate fly ash reinforced copper matrix composites by friction stir processing (FSP) and analyze its performance for microstructure and mechanical properties. Microstructural features were depicted by optical microscopy, scanning electron microscope and electron backscattered diffraction across cross-section. Hardness was observed across cross-section of the processed plate for plotting hardness profile. Tensile test was conducted on base and processed plate for strength. The composite exhibited uniform and homogeneous sputtering of fly ash particles in the copper matrix without agglomeration of particles irrespective of the position in stir zone which may be attributed to the solid state nature of the process. No disturbance in terms of voids or irregularities was detected at the interface which shows excellent integrity at the interface. Substantial grain refinement for the copper matrix along with fracture of the reinforced fly ash was observed. It was also observed that the hardness and tensile strength of the composite improved but ductility decreased. The mechanism responsible for hardness and strength improvement may be attributed to grain refinement and uniform dispersion of fly ash particles. Reduced ductility may be due to the presence of fly ash particles which brought brittleness to the composite.

Link: <https://doi.org/10.1016/j.jmrt.2025.05.141>



TITLE:

Reduction In Pavement Thickness Using
Geogrid-An Economic Approach For NHAI
Project

AUTHOR :

S.K., Sonawane, Sagar K.; U.J., Shaikh, Umair
Javed; R.G., Rathod, Rajshekhar G.; Y.L.,
Bhirud, Yuvaraj L.; N., Mohammed,
Nayeemuddin; A.G., Tanawade, Archana Girish;
S., Sathe, Sandeep, S., Dandin, Shahbaz

JOURNAL NAME:

International Journal of Environmental Sciences
(Vol.-11, Issue-165)

DETAILS:

Published on July 2025



ABSTRACT:

This research examines the National Highways Authority of India (NHAI) seeks cost-effective and sustainable solutions to improve pavement performance while reducing construction costs. This study explores the structural and economic benefits of integrating geogrid reinforcement in flexible pavements, focusing on optimizing layer thickness without compromising strength. Using mechanistic-empirical analysis, the research compares conventional (IRC 37 compliant) and geogrid-reinforced designs, evaluating subgrade strength, traffic loads and material properties. Findings reveal that geogrids can reduce pavement thickness by 15-25%, yielding significant cost savings through material efficiency, faster construction and enhanced longevity. The study advocates geogrid adoption as a sustainable solution, supporting India's infrastructure development and resource optimization goals.

Link: <https://theaspd.com/index.php/ijes/article/view/3635>



TITLE:

Editorial: Metaheuristics for sustainable manufacturing

AUTHOR :

A.J., Kulkarni, Anand Jayant; P., Siarry, Patrick

JOURNAL NAME:

Engineering Applications of Artificial Intelligence

DETAILS:

Published on August 2025



ABSTRACT:

In the recent times, several Artificial Intelligence (AI) based nature inspired optimization methods have been proposed. They are commonly referred to as metaheuristics. They could be further classified as bio-inspired, socio-inspired and physics-based methods. The issue can accommodate the original contributions applying metaheuristics to the following domains such as Manufacturing quality control and reliability, Process efficiency and sustainability, Production, manufacturing and logistics, Human resource and safety at the shop floor, Industrial waste Management, Material movement and handling systems, Machining processes, Manufacturing processes, Improve energy consumption, etc.

Link: <https://doi.org/10.1016/j.engappai.2025.112101>



TITLE:

In-Vessel Aerobic Composting of Food Waste
Using Biochar as Bulking Agent and Jaggery as
Accelerator

AUTHOR :

A.S., Dharnaik, Amit Shivputra; R., Bandgar,
Rushikesh; S.B., Patil, Satish B.

JOURNAL NAME:

Compost Science and Utilization

DETAILS:

Published on 26 August 2025



ABSTRACT:

This study investigated the potential of jaggery as an accelerator for the aerobic composting of food waste. The experimental trials were conducted over 30 days with varying jaggery concentrations (0%, 5%, 10%, 15%, and 20%) to determine its effect on decomposition rate and compost quality. Key parameters like total organic carbon, total Kjeldahl nitrogen, carbon/nitrogen (C/N) ratio, phosphorus and potassium loss, heavy metal content, and maturity indices were analyzed. Results showed that jaggery significantly accelerated the composting process, evidenced by faster TOC reduction (from 52.8–53.8% to 40.21–42.5%), increased TKN (from 0.95–0.99% to a maximum of 1.69%), and a more rapid decline in the C/N ratio (from 53.33–56.63 to a minimum of 24.38), particularly in trials with higher jaggery content. However, the accelerated decomposition also led to greater phosphorus (up to 72.13% loss) and potassium (up to 65.04% loss) losses. Despite these losses, all compost samples met the standards for Class A compost, indicating their suitability for organic farming. This study concluded that jaggery effectively enhanced food waste composting, but optimizing its concentration was crucial to balance nutrient release and retention for producing high-quality compost.

Link: <https://doi.org/10.1080/1065657X.2025.2548223>



TITLE:

Greenwashing

AUTHOR :

U.K., Sahu, Udit Kumar; A.K., Pradhan, Ashis Kumar

JOURNAL NAME:

Elgar Encyclopedia of Energy Economics

DETAILS:

Published on 8 November 22 May 2025



ABSTRACT:

In this entry, we broadly discuss the growing concern of greenwashing behavior among companies as a major hindrance to achieving the Sustainable Development Goals and net zero emissions. More specifically, we highlight the origin, essence, measurement, types, and methods of greenwashing behavior used by companies who make claims and provide assurances about their environmentally friendly approach to their product and services. Our entry also stresses the consequences of and ways to combat such behavior. Based on our discussion, we endorse more transparency related to the reporting of greenwashing behavior and several responsibilities of stakeholders in helping to reduce such behaviors and assist in achieving environmental sustainability in the truest sense.

Link: <https://doi.org/10.4337/9781035310371.00078>



TITLE:

Harnessing the Power of Flavonoids: A Natural Remedy for Urolithiasis

AUTHOR :

M.M., Sabale, Mrunal M.; P.A., Marne, Prathamesh A.; A.A., Tagalpallewar, Amol Ambadas; A.M., Baheti, Akshay M.

JOURNAL NAME:

Research Journal of Pharmacy and Technology
(Vol.-18, Issue-6)

DETAILS:

Published on June 2025



ABSTRACT:

Urolithiasis ranks as the third most prevalent kidney disease, affecting 12-15% of the global population. It has a recurrence rate of 70-81% in males and 47-60% in females. Kidney stone disorder is a complex condition that progresses through several stages, including supersaturation, nucleation, growth, aggregation, and retention within the kidneys. This condition can lead to significant medical issues, such as infections, urinary tract obstruction, and severe pain. Most kidney stones primarily consist of calcium oxalate. While treatments such as surgery, ureteroscopy, percutaneous nephrostolithotomy and open or laparoscopic stone removal are available, they are often unpleasant and costly. Herbal remedies continue to be employed for the treatment and prevention of kidney stones. Recent studies have demonstrated that plant flavonoids exhibit significant anti-inflammatory, antioxidant, diuretic, antibacterial, and other beneficial effects against kidney stone formation, both in vitro and in vivo. Therefore, flavonoids or plant extracts rich in flavonoids associated with anti-urolithiasis activity have been evaluated. This article emphasizes the use of plants as a remedy for kidney stones. It reviews the types of kidney stones, the pathophysiology of stone formation, the role of natural diet in kidney stone development, and the role of flavonoids in managing urolithiasis.

Link: <https://ouci.dntb.gov.ua/en/works/7B6zLp8B/>



TITLE:

Handling Imprecise Climate Information: A Neutrosophic Generalized Estimator Under Stratified Ranked Set Sampling for Population Mean

AUTHOR :

A., Kumari, Anamika; A., Singh, Abhishek; V., Singh, Vishwajeet

JOURNAL NAME:

International Journal of Mathematics and Mathematical Sciences (Vol.-2025, Issue-1)

DETAILS:

Published on August 2025



ABSTRACT:

Researchers under classical statistics often rely on precise, determinate data to estimate population parameters. However, in certain situations, data may be indeterminate or imprecise. Traditional approaches often fail to manage the complexities of uncertainty, necessitating the development of advanced methodologies like neutrosophic statistics. To address these challenges by handling vague, indeterminate, and uncertain information effectively, the study employed an entirely novel sampling technique known as “neutrosophic stratified ranked set sampling” and designed specialized neutrosophic estimators to enhance the accuracy of population mean estimation under uncertainty. This study developed neutrosophic generalized estimators that incorporate auxiliary information within the stratified ranked set sampling framework, leading to more precise population mean estimation under ambiguous conditions. Theoretical assessments included the derivation of bias and mean squared error (MSE) equations for these estimators, providing deeper insight into their efficiency. The performance of the proposed estimator was evaluated using simulated data using the R programming language as well as real-world datasets with indeterminate data, including relative humidity. The results demonstrated that the new estimators outperformed traditional methods in terms of MSE and percentage relative efficiency (PRE), highlighting their superior accuracy. By producing interval-based results, the proposed methodology provided a more comprehensive representation of uncertainty in population parameter estimation. This, along with reduced MSE, significantly improved the estimators’ reliability. The empirical validation, supported by numerical experiments and simulations conducted in R, further reinforces the practicality and robustness of the proposed methods, affirming their relevance for real-world applications.

Link: <https://doi.org/10.1155/ijmm/4935567>



TITLE:

Waste Water Treatment Using Membrane
Bioreactor: A Brief Review

AUTHOR :

V.S., Wadgaonkar, Vinayak S.; S.A., Bhatkar,
Siraj A.; D.S., Bhutada, Dinesh S.; P.D.,
Khurpade, Pratiksha D.; A., Palsodkar, Abhijit

JOURNAL NAME:

International Journal of Environmental Sciences
(Vol.-11, Issue-5)

DETAILS:

Published on July 2025



ABSTRACT:

The exponential rise in human population has fueled expansion in a wide range of industries. Today, a reliable water supply and the ability to process wastewater efficiently to generate high-quality wastewater are considered necessities. By removing both organic and inorganic particles, membrane bioreactors (MBRs), a biological unit for wastewater treatment, can be used to simultaneously address these two urgent issues. MBR facilities have several advantages over more conventional methods like activated sludge because of the combination of the biological process with membrane filtration. They are widely employed in the industrial and municipal wastewater treatment industries. We'll go through the fundamentals of MBR plants in this survey, from their core ideas to the most recent advancements in each component. After thoroughly investigating the features of the bioreactor treatment process, the parameters of the membrane separation procedure are investigated. Both the fouling phenomenon and modern methods for reducing fouling are presented in detail. Fouling is a serious problem that prevents MBRs from being used more frequently. Efforts from a variety of innovative MBR processes are summarised. Issues that now exist and future research projects that could help make MBRs more practically applicable on a larger scale are proposed.

Link: <https://theaspd.com/index.php/ijes/article/view/5598>





TITLE:

Explaining Condition-Based Maintenance for Metro Trains Using Ensemble ML with XAI and Hybrid Deep Learning Models

AUTHOR :

A., Singh, Aniket; S.S., Bobde, Sarika Sanjay

JOURNAL NAME:

Conference: 2025 Global Conference in Emerging Technology (GINOTECH)

DETAILS:

Published on 17 July 2025



ABSTRACT:

Metro train systems serve as a backbone for urban transportation but are increasingly vulnerable to operational failures, which can disrupt services and compromise passenger safety. Ensuring their reliability requires robust and accurate methods for failure classification and remaining useful life (RUL) estimation. However, existing approaches often face significant challenges, including imbalanced datasets, high computational costs, reliance on synthetic data, difficulties in processing large time-series datasets, and risks of overfitting. To address these challenges, this research proposes a comprehensive framework of ensemble machine learning methods like Stacking, Random Forest, Bagging, and XGBoost and advanced hybrid deep learning models like TCN-GRU which combines the temporal feature extraction capability of Temporal Convolutional Networks (TCNs) with the sequential modelling efficiency of Gated Recurrent Units (GRUs). Furthermore, resampling techniques like down-sampling for large time series dataset were employed to retain over 90% of the original data variance, significantly reducing computational overhead. Explainable AI (XAI) tools, such as SHAP and LIME, were integrated only into the ensemble methods to enhance interpretability. The proposed framework was evaluated on a real-world metro train dataset, with a focus on the air production unit due to its critical role in train brakes. Results demonstrated that ensemble methods like Stacking performed robustly in failure classification, and the hybrid TCN-GRU model achieved the best results in remaining useful life (RUL) prediction. Also, the results shows that the integration of SHAP offers actionable insights into ensemble models like xgboost, allowing maintenance teams to identify and adjust key variables, thus reducing the chances of future failures. This study underscores the potential of ensemble and hybrid models for advancing predictive maintenance in public transportation. The proposed approach offer...

Link:

<https://doi.org/10.1109/GINOTECH63460.2025.11076995>



TITLE:

Automatic Block Removal and Anticlogging in a Drainage Management System via a Hybrid Fuzzy Deep Learning Approach

AUTHOR :

V.S., Gawali, Vikram Sadashiv; M.S., Pande, Milind S.; M., Sayyad, Munir; R.S., Bhadade, Raghunath Subhanrao

JOURNAL NAME:

Irrigation and Drainage

DETAILS:

Published on 20 August 2025



ABSTRACT:

Essentially, drainage systems (DSs) frequently suffer from blockages, thus resulting in costly maintenance. Therefore, various studies have focused on detecting blockages arising in DSs; however, this has been difficult during pandemic situations. Therefore, this article aims to implement a fully automated system for real-time blockage removal in DSs via a hybrid fuzzy deep learning approach. The sensor data are primarily gathered. During preprocessing, noise removal is performed via Spearman's rank correlation coefficient applied via the pairwise attribute noise detection algorithm (SRCC-PANDA). Thereafter, the proposed two-sided Gaussian-fuzzy C-means clustering (TSG-FCMC) is established to group the data into three different classes. If the data are clustered into a blockage class, then the manhole status is determined via the rule-based decision controller (RBDC). Afterward, to locate the blockage, the unmanned autonomous surface vehicle (UASV) is used. Additionally, the proposed APTx activated-active-learned-recurrent neural network (AAL-RNN) significantly categorizes the types of blockages. Thus, the proposed approach achieved a noticeable accuracy, precision and recall of 97.7%, 98.1% and 97.3%, respectively. Hence, the outcome showed that the proposed technique outperformed conventional methods with effective performance measures. The proposed work is highly recommended for large-scale deployment, thus enhancing public health safety.

Link: <https://doi.org/10.1002/ird.70023>





TITLE:

Multi-pulse chronotherapeutic approaches for circadian rhythm disease management

AUTHOR :

S.S., Kole, Sanika S.; R., Vinchurkar, Rutuja; R., Desai, Rutuja; P., Wagh, Prajakta; A., Marne, Ambar; H., Karnik, Harshavardhan; A.R., Gawade, Ashwini R.; A.B., Kuchekar, A. B.

JOURNAL NAME:

Chronobiology International

DETAILS:

Published on 18 August 2025



ABSTRACT:

This review explores the field of multipulse drug delivery systems, emphasizing their potential to transform drug administration and improve therapeutic outcomes. Multipulse systems provide controlled and sustained medication release by emulating the body's natural rhythms and utilizing advanced technologies such as stimuli-responsive systems, artificial intelligence, and nanotechnology. The review examines the classification, mechanisms, and benefits of multipulse systems, highlighting their significance in chronic disease management and personalized medicine. Integrating artificial intelligence with personalized medicine enables the development of customized drug delivery systems that improve efficacy, reduce side effects, and enhance patient compliance. As we advance toward the era of precision medicine, the combination of technological and pharmaceutical innovations shows great promise for optimizing patient care and treatment outcomes.

Link: <https://doi.org/10.1080/07420528.2025.2546008>



TITLE:

Correction to: pH-Responsive Natural Polymers as Versatile Carriers for Drug Delivery in Breast Cancer: A Review (Biomedical Materials & Devices, (2025), 10.1007/s44174-025-00427-w)

AUTHOR :

P.D., Velapure, Pallavi Dasharath; S.R., Chakote, Shantanu Rajkumar; D., Kansal, Divyanshi; A., Barooah, Anita; D.M., Pawde, Datta Maroti; C.D., Bobade, Chandrashekhar D.

JOURNAL NAME:

Biomedical Materials and Devices

DETAILS:

Published on August 2025



ABSTRACT:

Cancer remains to be among the leading causes of mortality globally, with over 10 million new cases reported annually. The tumor microenvironment and complexity poses considerable challenges to breast cancer treatment. Various intrinsic and extrinsic stimuli, including temperature, redox conditions, ultrasound, magnetic fields, and pH, can be used for triggering drug release. The intracellular pH of solid tumors is maintained to remain lower than the extracellular pH. Consequently, pH-responsive nanoformulations demonstrate superior efficacy in drug delivery to tumors relative to conventional formulations. Natural polymers based nanoformulations offers a novel approach to overcome these stimuli related limitations. The acidic tumor microenvironment of solid tumours can be exploited by pH responsive nanoformulations to achieve a smart stimuli responsive drug delivery. Natural polymers have some abundant functional groups that enable chemical modification to enhance solubility of drug, loading capacity of drugs and also targeting ligand attachment. This review explores the types of pH-responsive natural polymers such as chitosan, alginate, and gelatin, describing their chemical structures and pH-response mechanisms, also highlighting the most representative applications of pH-responsive polymers in cancer therapy. Recent advancements, present challenges, and the clinical significance of natural polymer-based nanocarriers for the treatment of breast cancer are all addressed in the article.

Link: <https://doi.org/10.1007/s44174-025-00427-w>



TITLE:

A survey on Face Sketch to Photo Translation based on Hybrid Optimization Algorithm and Deep Learning Technique

AUTHOR :

D.R., Patil, Dhanashri Rohan; Y.C., Kulkarni, Yogini C.; V.S., Gutte, Vitthal S.

JOURNAL NAME:

Conference: 2025 Seventh International Conference on Computational Intelligence and Communication Technologies (CCICT)

DETAILS:

Published on 29 July 2025



ABSTRACT:

The objective of sketch-based face image generation is to produce synthetic, highly consistent, and photorealistic face images from input sketches. These images can be used in a variety of fields, including criminal investigation, human-computer interface, entertainment, and virtual human design. The Generative Adversarial Networks (GANs) helps to find the real images from the sketches. It produces a realistic and high-quality face photo with attributes identical to those of the input sketch. The study shows that the different methods are available for the real image generation from the raw data or raw sketch available. The study also shows that the evolutionary method and upgradation in recent techniques are more prominent than the other existing methods. The development of Neural Radiance Fields (NeRFs) and a deep learning approaches, are powerful implicit 3D representation. This study also demonstrates that even the Frequency-consistent (FC) loss is there it can be applied to different generative model for the overall performance, the generated high-fidelity and high-quality images corresponding to the text description and allowed the editing of real images.

Link: <https://doi.org/10.1109/CCICT65753.2025.00066>



TITLE:

QSAR Model for Aquatic Toxicity Estimates
Using Machine Learning

AUTHOR :

J., Ghorpade-Aher, Jayshree; A., Saxena,
Anmol; M., Inamdar, Misba; A., Thakre, Ayush;
D., Sinha, Drishti; T., Thesiya, Tirth

JOURNAL NAME:

Lecture Notes in Electrical Engineering (Vol.-
1398 LNEE)

DETAILS:

Published on 30 July 2025



ABSTRACT:

Determining the aquatic toxicity of organic compounds is still a crucial requirement for environmental management and regulatory compliance. QSAR models are a suitable alternative for use in predictive toxicology since they can assist address the problem of high prices and time spent on experimental assays, which will ultimately lead to a reduction in the cost of resources. This work's primary objective is to assess and forecast acute aquatic toxicity using QSAR modeling methodologies. This gives decision-makers in chemical management and risk assessment a starting point. The accuracy of forecasting is astounding thanks to a thorough data fusion and model optimization, and it can be a useful tool for determining the levels of toxicity on the abundance of organic compounds. Because computational methods are based on the fundamental principles governing the intermolecular interactions of chemical structures with aquatic species, they not only expedite the assessment process but also enhance our understanding of the fundamentals of structure–toxicity relationships.

Link: http://dx.doi.org/10.1007/978-981-96-4679-1_31



TITLE:

On the circuits of splitting matroids representable over $GF(p)$

AUTHOR :

P.P., Malavadkar, Prashant P.; U., Jagadale, Uday; S., Gunjal, Sachin

JOURNAL NAME:

Ars Combinatoria (Vol.-163)

DETAILS:

Published on 28 June 2025



ABSTRACT:

We apply the splitting operation defined on binary matroids (Raghunathan et al., 1998) to p -matroids, where p -matroids refer to matroids representable over $GF(p)$. We also characterize circuits, bases, and independent sets of the resulting matroid. Sufficient conditions to yield Eulerian p -matroids from Eulerian and non-Eulerian p -matroids by applying the splitting operation are obtained. A class of connected p -matroids that gives connected p -matroids under the splitting operation is characterized. In Application, we characterize a class of paving p -matroids, which produces paving matroids after the splitting operation.

Link: <https://doi.org/10.61091/ars163-02>





TITLE:

Visualizing the Alarming Surge: Mapping and Analyzing Suicide Patterns Across India

AUTHOR :

P.S., Metkewar, P. S.; S.I., Yaqoob, Syed Irfan;
S.S., Joshi, Shubhalaxmi Sanjay; A., Mishra,
Anshul; I., Kalbandhe, Ishita

JOURNAL NAME:

Lecture Notes in Networks and Systems(Vol.-
1317 LNNS)

DETAILS:

Published on July 2025



ABSTRACT:

Differences in self-destruction rates among particular nations and socio-segment fragments highlight the perplexing exchange between cultural settings and mental pain. Remarkably, perceivable varieties arise in the commonness of suicides among two disparate gatherings: ranchers and understudies. Illustratively, inside the Indian setting, the year 2012 saw an upsetting frequency wherein more than 2200 understudies depended on self-destruction as a reaction to scholarly under accomplishment, subsequently featuring the intense tensions related with scholastic assumptions. On the other hand, the heartbreaking peculiarity of rancher suicides is credited to a conjunction of elements that render self-destruction as a critical response even with outlandish monetary misery, frequently denoting a last-ditch supplication for mitigation from their quandary. The natural meaning of agribusiness in the Indian economy is undeniable, yet, the predicament of Indian ranchers remains generally unacknowledged. A stunning extent of rancher suicides—50% to be exact—exudes from Maharashtra, in this way typifying the gravity of the issue inside a particular geographic setting. Considering India's far reaching demography and financial scene vigorously dependent on horticulture, a convincing basic arises for the public authority to proactively address the unavoidable disgrace covering emotional well-being issues, which thus energizes the troubling twisting of suicides. In a faithful pursuit to grasp the nuanced features of this upsetting pattern, our review tries to unwind the fundamental self-destruction risk factors natural for Indian ranchers and understudies. Strategically grounded, our investigation dives into an exhaustive dataset incorporating 236,583 perceptions traversing the worldly range of 2012–2020, fastidiously examining seven unmistakable factors that unpredictably clarify the complicated embroidery of self-destruction occurrences revealed across India.

Link: http://dx.doi.org/10.1007/978-981-96-3942-7_39



TITLE:

Electrokinetic Soil-Water Remediation: A Comprehensive Exploration

AUTHOR :

A.A., Bokde, Alpesh Ashok; A., Subash, Alsha;
V., Gholap, Vishwanath; K., Balasubramanian,
Kandasubramanian

JOURNAL NAME:

Separation and Purification Reviews

DETAILS:

Published on 11 August 2025



ABSTRACT:

The escalating global concern over soil and water contamination necessitates innovative and integrated remediation strategies. Electrokinetic remediation (EKR) has emerged as a versatile and scalable technique capable of mobilizing a wide range of contaminants under controlled electric fields. This review presents a critical and systematic analysis of recent advancements in EKR, encompassing laboratory-scale investigations, field-scale implementations, and comparative performance across diverse environmental matrices. This work emphasizes the synergistic integration of EKR with emerging technologies -including nanomaterials, phytoremediation, bioremediation, and advanced oxidation processes - highlighting their potential to overcome the conventional EKR limitations such as low efficiency in heterogeneous soils and energy consumption. By synthesizing case studies across varied geographies and contaminant profiles, this review identifies key knowledge gaps in scalability, contaminant specificity, and long-term sustainability. It concludes by outlining future research directions, focusing on material innovation, system optimization, and techno-economic feasibility to guide the next generation of hybrid EKR-based remediation technologies.

Link: <https://doi.org/10.1080/15422119.2025.2537073>



TITLE:

Harnessing endophytes for enhancing the production of valuable plant secondary metabolites

AUTHOR :

V., Bankar, Vrishali; S.S., Chapadgaonkar, Shilpa Samir

JOURNAL NAME:

Natural Resources for Human Health (Vol.-5, Issue-4)

DETAILS:

Published on July 2025



ABSTRACT:

The vast diversity of plant species on Earth harbors an equally rich and untapped reservoir of microbial endophytes, offering immense potential for sustainable development and biotechnological innovations. The plant microbiome is a key regulator of plant secondary metabolic pathways. This interaction could be exploited to increase the production of phytochemicals of commercial interest. These phytochemicals have diverse applications in industry, agriculture, and pharmaceuticals. The growing potential of endophytes as bio-factories for synthesizing bioactive phytochemicals is particularly intriguing. Recent breakthroughs in host-independent metabolite synthesis by endophytes present an interesting alternative to over harvesting endangered medicinal plants. The examples of host-free metabolite production and bioprocessing techniques for harnessing the endophytes to improve plant metabolite production have been thoroughly examined. This review sheds light on the omics technologies poised to transform endophyte-plant interactome research and its potential applications.

Link: <https://doi.org/10.53365/nrfhh/206024>



TITLE:

Plasmonics for Chemical Transformation: From Fundamentals to the Cutting-Edge Applications

AUTHOR :

D.K., Thapa, Dev Kumar; S., Biswas, Soumava

JOURNAL NAME:

ChemPhysChem

DETAILS:

Published on 11 August 2025



ABSTRACT:

Plasmonic nanostructures, leveraging the phenomenon of localized surface plasmon resonance, have emerged as transformative tools in chemical catalysis by enabling reaction pathways inaccessible to conventional approaches. This review consolidates the fundamental principles of plasmonics and highlights recent advancements in their application to sustainable chemical transformations, such as CO₂ reduction, selective oxidation, and hydrogenation. Notably, the innovative use of plasmon-induced hot carriers and field enhancement effects in overcoming reaction barriers, achieving unprecedented reaction selectivity and efficiency under mild conditions, is explored. The review underscores significant contributions, including the strategic coupling of plasmonic metals with defect-engineered supports, facilitating charge separation, and enabling selective product formation. The review introduces the potential of chiral plasmonic nanostructures for asymmetric synthesis, a frontier yet to be fully explored. Additionally, the review also explores the potential of alternative, cost-effective materials like aluminum and magnesium for use in plasmonic systems. Furthermore, key challenges in plasmonics, such as reducing energy losses and improving scalability have been discussed.

.Link: <https://doi.org/10.1002/cphc.202401102>



TITLE:

Improving Ergonomic Safety in Agricultural Brush Cutters: Design Intervention and Evaluation

AUTHOR :

G.S., Jadhav, Ganesh S.; V., More, Vedant; P., Vilankar, Pravasha; M.S., Alam, Md Sarfaraz

JOURNAL NAME:

Journal of Integrated Design and Process Science

DETAILS:

Published on 28 July 2025



ABSTRACT:

Background: The growth of unwanted weeds and shrubs in agricultural fields increased the use of special machines called brush cutters to cut them down. Due to the increased use of brush cutters among the farmers, many use the machine in various awkward postures. This may cause multiple work-related disorders. In this study, problems are identified, and a design intervention is proposed that aids in improving the farmers' posture and reducing health issues faced by them.

Objective: This study aims to analyse existing brush cutter models and evaluate operator postures to identify ergonomic challenges. The research further focuses on developing and accessing an improved design using ergonomic evaluation techniques to enhance usability and reduce operator strain.

Methods: Rapid Entire Body Assessment (REBA) tool was used for the postural analysis of the operators. Methodology chart and Pugh chart analysis was used to determine the design of the final concept.

Results: The REBA analysis suggested a change in brush cutter design to improve the overall health of the operators and reduce injuries. This study presents an innovative brush cutter design aimed at reducing workload by redistributing the machine's weight for improved operator comfort.

Conclusion: The new concept was designed using REBA, Pugh analysis, and a morphology chart to help mitigate pain and injuries experienced by operators due to prolonged use of existing brush cutters.

Link:

<https://journals.sagepub.com/doi/10.1177/10920617251360945>



TITLE:

Measuring employee attrition intention in an auto-component manufacturing organisation

AUTHOR :

P., Hinge, Punamkumar; H.A., Salunkhe, H. A.;
M., Boralkar, Mohit; S.S., Bang, Sanjay
Satyanarayan; A.R., Thakur, Abhijeet R.; V.R.,
Adhegaonkar, Vikas Ramesh

JOURNAL NAME:

SA Journal of Human Resource Management
(Vol.-23)

DETAILS:

Published on 29 July 2025



ABSTRACT:

Orientation: The auto-component manufacturing sector, a critical contributor to industrial growth, faces persistent challenges related to employee attrition, affecting operational efficiency and workforce stability. This study examines the influence of job satisfaction, work-life balance, and job stress on attrition intention among employees in Indian auto-component manufacturing organisations. **Research purpose:** To identify the key factors contributing to employee turnover and evaluate their relative impact on attrition intention. **Motivation for the study:** Amid rising concerns over attrition in the manufacturing industry, this research aims to explore how work-life balance and job stress influence employees' intentions to leave their organisations. **Research approach/design and method:** Data were collected from 192 employees across 10 auto-component manufacturing companies in Pune, Maharashtra, India, using a structured questionnaire. The responses were analysed through structural equation modelling (SEM) using SPSS and AMOS. **Main findings:** The study reveals that work-life balance and job stress significantly impact attrition intention. Employees with poor work-life balance and high job stress are more likely to consider leaving. However, job satisfaction does not have a direct effect on attrition intention. **Practical/managerial implications:** Organisations should prioritise improving work-life balance and managing job stress by implementing flexible work policies, wellness programmes, and realistic workload distribution. **Contribution/value-add:** This study underscores the importance of addressing work-life balance and job stress in retention strategies, offering actionable insights for HR managers to mitigate attrition in the auto-component manufacturing sector

Link: <https://doi.org/10.4102/sajhrm.v23i0.3003>



TITLE:

Cardiovascular Disease Prediction Using ML
Based Classification Methods

AUTHOR :

A., Gunjal, Anita; T., Judgi, T.

JOURNAL NAME:

Conference: 2025 International Conference on
Advances in Modern Age Technologies for
Health and Engineering Science (AMATHE)

DETAILS:

Published on 22 July 2025



ABSTRACT:

Now a day's heart problems are major cause of death, making it crucial to develop effective diagnostic methods. The early detection of cardiovascular abnormalities can enable timely interventions, leading to enhanced patient health condition and minimizing medical expenses. The development of machine learning (ML) techniques has offered promising avenues to revolutionize the landscape of CVD detection. In this research, classification techniques, including Random Forest (RF), SVM and Multiple Logistic Regression are used to diagnose heart diseases. Applying the patient dataset description, the dataset was normalized and missing values were dealt with, after which feature selection was performed to determine the best predictors. All classifiers were tested using cross-validation technique, and performance is measured using precision, recall, AUC-ROC and accuracy. Each classifier displayed significant strengths in terms of Recall, Precision, and F1-Score for both classes: absence and presence of heart disease. The studies show that RF has slightly higher accuracy as compared to others, but SVM has the highest precision value. As such, these classifiers hold the promise of improving the diagnosis of heart diseases.

Link:

<https://doi.org/10.1109/AMATHE65477.2025.11081176>





TITLE:

Generative Models Reimagined: Review into Resource-Efficient Training

AUTHOR :

A., Teke, Aditya; N.N., Pise, Nitin N.

JOURNAL NAME:

Cogent Business and Management Conference:
2025 6th International Conference on Control,
Communication and Computing (ICCC)

DETAILS:

Published on 18 July 2025



ABSTRACT:

In the era of rapid improvements to generative artificial intelligence, resource-effective training methods are important for optimising models like BERT, ChatGPT, and Gemini. These large-scale models require tremendous processing capacity, which might be a barrier to scalability and sustainability. This review paper dives into novel strategies that improve computing economy while maintaining model performance. Architectural optimisation, quantisation, models pruning, and effective ways for discovering high-quality datasets while maintaining accuracy are among the key topics explored. The research emphasises sustainable AI approaches by demonstrating methods for reducing resource use while maintaining the resilience for generative models across several datasets. Furthermore, this paper identifies additional areas for study, such as refining model structures to reduce energy usage, improving data selection approaches, and creating hybrid models that incorporate different resource-saving techniques. Finally, the paper seeks to contribute to current efforts to balance AI developments with the requirement for long-term, scalable, and efficient model training methods.

Link: <https://doi.org/10.1109/ICCC64910.2025.11077170>





TITLE:

Japan-India Collaboration in Northeast India:
Opportunities and Challenges

AUTHOR :

R., Borah, Rupakjyoti

JOURNAL NAME:

International Studies

DETAILS:

Published on 12 July 2025



ABSTRACT:

Japan and India have ties going back centuries, when Buddhism spread from the land of its birth, India, to Japan. However, for much of the Cold War era, India and Japan stayed aloof from one another as they were in opposite camps. India was close to the erstwhile Soviet Union, while Japan became a key US ally. The end of the Cold War positioned these two nations on a trajectory that enabled their relations to grow from a global partnership to a strategic one. A recent development has been the Government of India's allowance to Japan to invest in Northeast India, which has a strong strategic significance. This commentary highlights this significant move.

Link: <https://doi.org/10.1177/00208817251340853>



TITLE:

Advanced fuzzy-based landslide prediction in high-risk regions using hybrid and statistical GIS models

AUTHOR :

N.S., Pawar, Nilesh Suresh; K.V., Sharma, Kul Vaibhav

JOURNAL NAME:

Physical Geography (Vol.-46, Issue-4)

DETAILS:

Published on 4 August 2025



ABSTRACT:

Landslide hazard assessment is vital for disaster risk reduction in the Raigad district of Maharashtra, India, a geologically complex and landslide-prone region. This study addresses the gap in landslide susceptibility mapping (LSM) by evaluating four models Fuzzy Analytic Hierarchy Process (FAHP), Analytic Hierarchy Process (AHP), Frequency Ratio (FR), and Shannon Entropy (SE), which have not been applied to Raigad District. Previous research has largely focused on broader regions, neglecting localized assessments. To conduct LSM in this area, 14 geo-environmental factors were analyzed, including topographic, climatic, geological, and land use characteristics. 174 landslide inventories with 70% allocated for training and 30% for validation. The FAHP model showed superior performance across all evaluation metrics with an Area Under the Receiver Operating Characteristic Curve (AUC-ROC) of 0.84, Precision of 0.86, Recall of 0.82, Accuracy of 0.85, and F1-Score of 0.84. Comparatively, AHP, FR, and SE achieved AUC-ROC values of 0.81, 0.79, and 0.71, respectively. According to the statistics, Poladpur, Mahad, Mangaon, and Shrivardhan are administrative subdivisions in the southern and southwestern parts that are highly susceptible to landslides. This work provides new insights to support informed decision-making for sustainable land use planning and disaster management.

Link: <https://doi.org/10.1080/02723646.2025.2542909>





TITLE:

Modelling quality assurance for placements of higher educational institutions

AUTHOR :

A., Kumar, Atul; A., Gawande, Amol; A.C., Sane, Ajit Chandrakant; S., Kale, Shailendrakumar; J.M., Paliwal, Jaiprakash M.; A., Agarwal, Akash; V., Brar, Vinaydeep; A., Saini, Amandeep; R., Dhaigude, Rahul; S., Nimbalkar, Sagar

JOURNAL NAME:

Quality in Higher Education

DETAILS:

Published on 4 August 2025



ABSTRACT:

The placement of students is an important parameter for quality evaluation of higher educational institutions across the globe. Given the significance of placements in higher education, the study aimed to determine if Indian higher education institutions are taking steps towards assuring the quality of placements. The authors developed a process quality assurance model for placements based on standard conceptual frameworks by researchers. Its likely effectiveness was evaluated by surveying 395 final-year students of higher education institutions across India. Respondents overwhelmingly agreed to the effectiveness of the process model of quality assurance for higher educational institution placements. Regarding existing placement efforts, a large majority disagreed that any quality assurance was in place, leading to poor placements. If a 'process model' is used to assure quality, it can significantly improve the placements of higher education institutions not just in India but in any part of the world.

Link: <https://doi.org/10.1080/13538322.2025.2532986>





TITLE:

Comparative analysis of life expectancy prediction using regression algorithms

AUTHOR :

N.B., Bahadure, Nilesh Bhaskarrao; R.B., Khomane, Ramdas B.; D., Raut, Deep; D., Bhagwatkar, Devanshu; H., Bakshi, Himanshu; P., Bawse, Priyanshu; P., Nagpal, Pari; P.D., Patil, Prasenjeet Damodar; M., Vishwakarma,

JOURNAL NAME:

Intelligent Decision Technologies (Vol.19, Issue-1)

DETAILS:

Published on 11 September 2024



ABSTRACT:

This study performed a comparative analysis of various imputations for NULL values in the dataset, namely, mean, median, and mode. We implemented eleven regression models, including Linear and Support Vector Regression and tree-based regression models, such as decision tree, Surrogate tree, and random forest, with five different pre-processing techniques, providing different types of results. The core objective of this study is to compare these results and reach an interpretation as to why certain imputation technique produces a certain output. The interpretation of this result is helpful in the selection of the regression model. The experimental results of the proposed technique were evaluated and validated for the performance and quality analysis of life expectancy prediction using various quality parameters. Among the results, the highest accuracy was produced by random forest regression with an accuracy of 96.8%, which proves the significance of random forest in comparison to other state-of-the-art regression methods for life expectancy prediction.

Link: <https://doi.org/10.3233/IDT-240983>



TITLE:

Advancing Heart Disease Prediction from ECG Signal Using Tangentially Incremental Learning-Based Pyramid Network

AUTHOR :

S.S., Mande, Smita Samrat; D.N., Wategaonkar, Dhanashri N.

JOURNAL NAME:

Biomedical Materials and Devices

DETAILS:

Published on 4 August 2025



ABSTRACT:

Heart disease remains the most prevalent chronic disorder and serves as the primary cause of high mortality worldwide. In recent years, heart disease prediction relying on an Electrocardiogram (ECG) using Deep learning (DL) has gained more attention due to the remarkable success. However, the existing DL methods fail to capture the subtle features and increase the computational complexity resulting in subpar performance. Hence, a novel Tangentially Incremental learning-enabled eXplainable Pyramid-based Scalar invariant Deep Network(TIXPSDN) is proposed in this research for achieving efficient heart disease prediction. Specifically, the Optimized Soft Wavelet Transform (OSWT) is adopted to pre-process the input ECG signal enhancing the quality by mitigating the outliers. Further, the Tangentially Luminant Spiral Movement Optimization (TLuSpMO) adaptively fine-tunes the hyperparameters of the proposed model and eliminates the local convergence issues. In addition, the usage of the incremental distributed learning technique along with the scalar invariant and Kernelized Channel Attention (KCA) mechanism stipulated the learning ability by achieving better scalability and interpretability characteristics. Moreover, the extraction of the pertinent features through the PFVS descriptor enhanced the overall prediction performance. Experimental results report that the proposed method established high efficiency by achieving a high accuracy of 97.81%, F1-score of 96.81, NPV of 96.86%, PPV of 98.46%, error rate of 0.021, and recall of 98.13% with 70% of training using MIT-BIH Arrhythmia database outperforming the other competing algorithms.

Link: <http://dx.doi.org/10.1007/s44174-025-00455-6>



TITLE:

Hybrid Nanointerfaces Empower Electrochemical DNA Biosensors for Escherichia Coli Detection

AUTHOR :

V., Verma, Vanshika; M.G., Kiran, Meghana G.;
R., Janbaz, Rahiel; R.A., Deshmukh, Rehan
Ahmed

JOURNAL NAME:

Analysis and Sensing

DETAILS:

Published on 5 August 2025



ABSTRACT:

Electrochemical DNA-based biosensors have shown great potential in the rapid and highly accurate detection of Escherichia coli (E. coli), offering advantages over conventional microbial detection techniques. By leveraging hybrid nanointerfaces, these biosensors are emerging as a promising alternative for the rapid, accurate, and affordable detection of E. coli. These biosensors offer real-time pathogen monitoring with minimal sample preparation by utilizing the high sensitivity of electrochemical transduction and the specificity of DNA hybridization. This comprehensive review covers the basic principles of electrochemical DNA biosensor functioning, transduction mechanism-based classification, and different immobilization techniques to improve biosensing performance. Significant developments in signal amplification, nanomaterial integration, and electrode surface modifications-particularly through the design of hybrid nanointerfaces, are reviewed, showing enhancements in detection stability, sensitivity, and selectivity. Additionally, the integration of nanomaterials has greatly enhanced sensor performance by improving signal stability and reducing the detection time. Despite these developments, problems with sample complexity, sensor downsizing, and practical implementation still exist. This review aims to highlight the most recent advancements, potential commercialization applications, and future directions in the field to facilitate the development of next-generation biosensors for the detection of pathogens.

Link: <https://doi.org/10.1002/anse.202500084>





TITLE:

SecureLayer: A Multi-Layered Architecture for
Tamper-Proof File Sharing via Blockchain-
Anchored Steganography and Visual
Cryptography

AUTHOR :

K., Sayta, Karina; D.N., Wategaonkar, Dhanashri
N.

JOURNAL NAME:

Conference: 2025 3rd International Conference
on Inventive Computing and Informatics (ICICI)

DETAILS:

Published on 15 July 2025



ABSTRACT:

Safeguarding file-sharing systems against advanced cyberthreats is crucial in this digital era. When it comes to cyber attacks, traditional encryption frequently fails. For tamper-proof data transfers, we suggest SecurChain, a multi-layered system that combines blockchain, adaptive steganography, and k,n -threshold visual cryptography. Dynamic LSB embedding reduces detectability by 40% by hiding sensitive information behind any harmless cover files (audio, images). Visual cryptography is used to divide the concealed data into n shares, removing single-point weaknesses by needing k combined pieces for reconstruction. With a latency of less than three seconds, blockchain smart contracts provide integrity and traceability by permanently recording each transaction. PSNR greater than 42dB, 98% steganalysis resistance, and less than 10% storage overhead were attained through thorough testing. A Tkinter GUI enables intuitive share management and blockchain auditing. SecureLayer complies with regulations such as the General Data Protection Regulation (GDPR) and prevents illegal access, manipulation, and data breaches. This universal solution bridges security and usability, offering robust protection for modern digital ecosystems.

Link: <https://doi.org/10.1109/ICICI65870.2025.11069751>



TITLE:

Adsorption Characteristics: Potential Use of Waste Pineapple Peel in the Removal of Acid Yellow 42

AUTHOR :

Deshmukh, Topare, Niraj S.; Raut-Jadhav, Sunita J. (54929430300); Patil,; Khan, Anish V. Chavali, Murthy S.

JOURNAL NAME:

Springer Proceedings in Materials (Vol.-77)

DETAILS:

Published on 27 July 2025



ABSTRACT:

Waste Pineapple Peel (WPP) was tested as a low-cost adsorbent for Acid Yellow 42 dye removal from wastewater. Many factors were examined, including dye concentration (10–40 mg/L), contact period (10–90 min), adsorbent dosage (0.5–2.5 g/L), pH (3–11), and agitation speed (400–800 rpm). The modifying agent for WPP was employed as nitric acid (HNO₃). Energy-dispersive X-ray (EDAX), Fourier transform infrared spectroscopy (FTIR), and a scanning electron microscope (SEM) were used to characterize the adsorbent. Results showed that Acid Yellow 42 dye was removed with 96% efficiency at 10 mg/L dye concentration, 2.0 g/L adsorbent dosage, 90 min, pH 3, and 800 rpm agitation speed. Isotherm analysis shows that the Langmuir isotherm model better describes the adsorption process. The most effective method for regenerating adsorbents involved reusing hydrochloric acid (HCl) for multiple cycles. The findings suggest that the utilization of modified waste pineapple peel (MWPP) as an adsorbent is a cost-effective and effective method for removing Acid Yellow 42 dye from wastewater.

Link: http://dx.doi.org/10.1007/978-981-96-6107-7_18





TITLE:

Empowering B2B Sales Through AI-Driven Human Resource Strategies: Bridging Marketing and HR for Enhanced Sales Performance

AUTHOR :

M., Chaudhari, Meghasham; M.K., Pendse, Meenal Kaustubh; V., Murhe, Varsha

JOURNAL NAME:

2025 3rd International Conference on Communication, Security, and Artificial Intelligence (ICCSAI)

DETAILS:

Published 14 July 2025



ABSTRACT:

The processes governing business-to-business (B2B) sales have witnessed slow evolution. The conjunction of AIs and planned HR practice provides a window of opportunity to heighten sales performance. This study emphasizes the cooperation of AI, HR, and Marketing in B2B sales processes. AI will disrupt talent acquisition, training, and performance evaluation in selling. AI will help an organization find a winning profile of its candidate and help personalize training solutions while also offering real-time insights for performance analytics to build a responsive sales team. Integration will bring a closer alignment of marketing and HR functions to a cohesive consumer engagement approach. Furthermore, the authors discussed how, through the conventional customer relationship management (CRM) framework, AI makes it easier for marketers to understand their clients and appreciate their preferences and behavior thoroughly. This knowledge will enable them to develop personalized marketing strategies and approaches that improve consumer satisfaction and loyalty. The integrative approach bridges Marketing and HR, promoting a continuous improvement culture steered by AI, according to the authors. This study argues that competitiveness in B2B selling hinges greatly on collaboration between disciplines and the underlying support of higher-level AI technologies. This investigation strengthens the existing body of research by offering a more detailed examination of the impact of AI on the HR and advertising departments in B2B sales. This study presents managers with a foundational understanding of how to integrate technology to increase sales performance.

Link: <https://doi.org/10.1109/ICCSAI64074.2025.11064015>





TITLE:

Sarcasm Detection in Social Media Texts Using
Natural Language Processing Techniques

AUTHOR :

Bhagat, Dhananjay Abhilash

JOURNAL NAME:

ICoICC 2025 - 3rd International Conference on
Intelligent and Cloud Computing

DETAILS:

Published on May 2025



ABSTRACT:

In the digital age, sarcasm is very hard to detect, it presents a significant challenge to sentiment analysis and natural language understanding systems. This research investigates application of machine learning algorithms to classify the data as sarcastic or non-sarcastic, emphasizing the tweets and its class. The data set was originally having four classes, which were optimized to combine irony and sarcasm as a sarcastic comment and normal and figurative as a non-sarcastic comment. Pre-processing techniques like text cleaning, stop-word removal, Tokenization, Vectorization etc. were used to remove noisy data and enhance feature selection.

Link:

<https://www.scopus.com/pages/publications/105012128981?inward>





TITLE:

Leveraging Blockchain for Secure Mobile Payment Systems: A Privacy Centric Approach

AUTHOR :

V., Musale, Vinayak; P.C., Bhosale, Poonam Chandrakant; S.S., Tharewal, Sumegh S.; M.S., Rao, Madhuri Shripathi; O., Ninawe, Ojas; A., Amune, Amruta

JOURNAL NAME:

Icoicc 2025 3rd International Conference on Intelligent and Cloud Computing

DETAILS:

Published on 2025



ABSTRACT:

Mobile payment systems have transformed financial transactions with unprecedented ease and accessibility. But the explosion in their numbers has been met with increasing security threats and issues of privacy. This paper puts forward a new blockchain-based paradigm for mobile payment systems that prioritizes privacy but retains high-security standards. This design leverages the essential capabilities of blockchain technology like decentralization, immutability, and cryptographic protection. It incorporates advanced privacy-protecting techniques such as zero-knowledge proofs and homomorphic encryption. The system design intended here is to mitigate common vulnerabilities present in centralized systems, reduce the risk of data breaches, and provide users with more control over their financial data. By comparative analysis and simulations, we show that our privacy-oriented blockchain solution strongly improves transaction security, minimizes fraud, and maintains user anonymity without sacrificing system performance or compliance with regulations. This work is a contribution to the ongoing work on developing more secure and privacy-aware financial technologies in a rapidly digitalizing economy.

Link:

<https://www.scopus.com/pages/publications/105012127485>





TITLE:

Sentiment Analysis of Hazardous Events and Disasters

AUTHOR :

Daga,Dumre,Rao, Madhuri Shripathi; Kumar,
Kulamala Vinod ; Tharewal, Sumegh S

JOURNAL NAME:

Icoicc 2025 3rd International Conference on
Intelligent and Cloud Computing

DETAILS:

Published on 2025



ABSTRACT:

This research addresses the critical need to understand the emotional and psychological impact of hazardous events and disasters by applying sentiment analysis to social media and textual data, specifically focusing on Twitter. Traditional disaster assessment often lacks insight into public sentiment, a vital factor for effective response and recovery. This paper explores the application of natural language processing (NLP) techniques to analyze public discourse on Twitter before, during, and after major disasters. The primary objective is to develop a robust sentiment analysis framework capable of accurately assessing and interpreting public sentiment using advanced NLP methods tailored for the characteristics of Twitter. This includes addressing challenges such as the real-time analysis requirements of Twitter's rapid, short-form posting style, the noisy and ambiguous nature of tweet data, and the need to capture evolving public reactions as events unfold. By identifying sentiment trends and patterns on Twitter, this research aims to provide timely and actionable insights for disaster management agencies, policymakers, and humanitarian organizations to enhance disaster preparedness, response strategies, and communication efforts. This approach seeks to leverage the immediate feedback provided by Twitter to complement traditional disaster assessment methods, incorporating the crucial dimension of public emotional well-being during crises. The work presented here provides an interesting rationale that combines public sentiment with machine learning techniques for effectively handling disaster response.

Link:

<https://www.scopus.com/pages/publications/105012124636?inward>





TITLE:

Sentiment Analysis and Automatic Bot Replier
for Drug Reviews

AUTHOR :

Shinkar, Ranjan, Bansal, Tamanna; Rao, Madhuri
Shripathi; Kumar, Kulamala Vinod

JOURNAL NAME:

2025 International Conference on Intelligent and
Cloud Computing (ICoICC)

DETAILS:

Published on 11 July 2025



ABSTRACT:

This research proposes a Natural Language Processing (NLP) system for sentiment analysis and interactive user interaction with drug reviews. We combine a web-scraped WebMD dataset with an existing UCI Drugs.com dataset to form a corpus of 5,000 drug reviews for diabetes, hypertension, migraine, and depression treatment. The system employs VADER for initial sentiment tagging, a Support Vector Machine (SVM) with TF-IDF as a baseline, a Voting Classifier (SVM + Logistic Regression), and a fine-tuned DistilBERT model for sophisticated sentiment classification. SpaCy and scispacy enable aspect extraction, identifying themes like side effects and efficacy. A Streamlit-Based chatbot provides context-aware responses, enhancing patient interaction. Visualizations like word clouds, heatmaps, and temporal sentiment plots display results. The system achieves 74% accuracy using SVM, 78% using the Voting Classifier, and 87% using DistilBERT, with 90% accuracy using aspect extraction. The chatbot responses are 92% relevant and 87% empathetic. This research streamlines pharmaceutical feedback analysis, with future goals to expand to larger data sets and generative AI for dynamic responses.

Link: <https://ieeexplore.ieee.org/document/11052169>



TITLE:

Commercial Activated Charcoal for Adsorption-Based Phenol Removal from Wastewater

AUTHOR :

N., Shah, Nishit; P., Walekar, Priyanka; S., Gadekar-Shinde, Shambala; N.S., Topare, Niraj S.; null; A.V., Khan, Anish V.

JOURNAL NAME:

Springer Proceedings in Materials (Vol.-77)

DETAILS:

Published on 27 July 2025



ABSTRACT:

One of the biggest problems in the world is water contamination, which is bad for people and the planet. There has been an increase in the discharge of wastewater into water resources due to the development of industrial and human activities. Common water contaminants include phenolic compounds from refineries, herbicides, insecticides, and medicines. Activated charcoal, clays, zeolites, membranes, and nanomaterials are often used materials for the adsorption-based removal of phenolic compounds. The objective of this study is to provide a comprehensive overview of research conducted on the removal of phenol utilizing different methodologies. This research aims to use commercial Activated Charcoal (AC) to remove phenol from aqueous solutions. SEM, i.e., scanning electron microscopy and FTIR, i.e., Fourier-transform infrared spectroscopy were used to characterize commercial AC. The effects of initial phenol concentration, adsorbent dosage, pH, and contact duration (10–100) mg/l, (1–2.5) g, pH (3–10), and (20–100) min, respectively, on removal capacity have been investigated. The effect of starting phenol concentration, adsorbent dosage, pH, and contact time was investigated using batch kinetic, thermodynamic, and isotherm analysis. The pseudo-second-order model, i.e., $R^2 = 0.99$ and the Langmuir isotherm, i.e., $R^2 = 0.99$, respectively, fit the phenol kinetics and equilibrium adsorption data extremely well. Phenol could be adsorbed onto activated carbon spontaneously and exothermically, as demonstrated by the thermodynamic parameters, which were negative. Results demonstrated that commercial ACs are excellent adsorbents for the removal of phenol from wastewater.

Link: http://dx.doi.org/10.1007/978-981-96-6107-7_16





TITLE:

A Comparative Study of RAG and Fine-Tuned Transformer Models for Domain-Specific Chatbots

AUTHOR :

Dhabalia, Bhate, Singh, Brandon Cerejo, Bhagat, Dhananjay Abhilash

JOURNAL NAME:

2025 International Conference on Intelligent and Cloud Computing (ICoICC)

DETAILS:

Published on 1 July 2025



ABSTRACT:

This paper explores the development of a customized chatbot for interactive website support, implemented using two separate methodologies: a Retrieval-Augmented Generation (RAG) framework and a fine-tuned transformer-based model. The chatbot is designed to provide accurate, domain-specific responses for the IRIS Club at MIT-WPU, handling questions about club activities, projects, events, and member information. We perform a comparative analysis of the two methods based on factors such as implementation difficulty, response accuracy, and resource consumption. The RAG-based solution integrates LangChain, HuggingFace embeddings, and the LLaMA-3 model accessed via Groq's API, whereas the alternative leverages a DistilBERT model trained on relevant data. To evaluate performance, we use metrics like cosine similarity, BERT score, ROUGE scores, and Flesch-Kincaid readability. Our findings indicate that both strategies are viable, each offering distinct advantages and limitations in terms of precision, ease of development, and computational efficiency.

Link: <https://doi.org/10.1109/ICoICC64033.2025.11052088>





TITLE:

Automated Psychological Profiling from
Children's Drawings Using Deep Learning and
Natural Language Processing

AUTHOR :

D.A., Bhagat, Dhananjay Abhilash; K., Maski,
Kartik; S., Randive, Swamil; null; R.V., Salunkhe,
Ramadevi Vitthal; D., Joshi, Devendra

JOURNAL NAME:

Icoicc 2025 3rd International Conference on
Intelligent and Cloud Computing

DETAILS:

Published on 2025



ABSTRACT:

Understanding the inner psychological world of children through their drawings has long been a cornerstone of developmental and clinical psychology. Traditional assessment techniques, such as the House-Tree-Person (HTP) test, rely heavily on expert interpretation, which is often subjective, time-consuming, and inconsistent across evaluators. In this research, we propose a novel AI-powered framework that fuses deep learning and natural language processing to automate the psychological interpretation of children's HTP drawings. The system employs ResNet-34, a convolutional neural network (CNN), for advanced image analysis to detect and interpret nuanced visual patterns in the drawings. These patterns are then transformed into coherent, human-like psychological insights using a transformer-based language generation model, specifically BART. Unlike static, template-driven systems, our approach dynamically generates rich, context-aware psychological narratives that align with clinical reasoning. This interdisciplinary methodology presents a significant step forward in augmenting traditional psychological evaluation with scalable, interpretable, and data-driven intelligence.

Link:

<https://www.scopus.com/pages/publications/105012099013>



TITLE:

Securing Electronic Patient Health Information (ePHI): An Analysis of Data Security and Compliance with Privacy Regulations

AUTHOR :

V., Musale, Vinayak; null; null; null; null; M.S., Rao, Madhuri Shripathi; A., Amune, Amruta

JOURNAL NAME:

Icoicc 2025 3rd International Conference on Intelligent and Cloud Computing

DETAILS:

Published on 2025



ABSTRACT:

With the rise in need of Electronic Health Records (EHR), keeping confidentiality, integrity, and privacy intact of Patient Health Information (PHI) becomes of utmost importance, particularly while sharing via email which is inherently non-secure. The current work proposes a hybrid encryption approach on the basis of Advanced Encryption Standard (AES-256) with symmetric key cryptography and Elliptic Curve Cryptography (ECC) as asymmetric encryption. AES-256 is selected because it performs well to encrypt large datasets, and ECC provides secure key exchange and digital signature support with less computation overhead compared to RSA. The system addresses issues of key encryption, such as secure transmission of information, identification authentication, and digital signatures for message integrity. Besides AES and ECC, the system incorporates a Zero-Knowledge Proof (ZKP) protocol, enabling privacy-preserving identity authentication without exposing sensitive data. This is important in ensuring PHI protection because ZKP permits identity and message authenticity verification with private data left secure. The hybrid system is balanced between speed of encryption and security, such that it remains scalable and usable for real-time healthcare use cases. By integrating AES for quick data encryption, ECC for secure key management, and ZKP for added privacy, this solution provides an end-to-end solution for securely sending PHI through email. It successfully solves encryption issues while maintaining confidentiality, integrity, and privacy in healthcare communication without compromising efficiency.

Link:

<https://www.scopus.com/pages/publications/105012098629?inward>





TITLE:

Self-Nanoemulsifying Drug Delivery Systems (SNEDDS) in Central Nervous System Diseases

AUTHOR :

P.A., Satish, Polshettiwar Arunrao; P.R., Khuspe, Pankaj R.; V., Chaudhari, Vishnu; A.B., Kuchekar, A. B.

JOURNAL NAME:

Application of Self-Nanoemulsifying Drug Delivery Systems in Inflammatory Diseases (Book Chapter)

DETAILS:

Published on May 2025



ABSTRACT:

Self-Nanoemulsifying Drug Delivery Systems (SNEDDS) have emerged as a promising strategy for addressing the challenges associated with low oral bioavailability of drug molecules due to insufficient water solubility. SNEDDSs consist of an oil phase, surfactant, and co-surfactant or co-solvent, and their characteristics, drug solubilization capacity, and in vivo considerations play a crucial role in selecting excipients. The optimization of SNEDDS formulations can be achieved through approaches such as phase diagram analysis and statistical design of experiments. Characterization of SNEDDSs involves employing multiple orthogonal methods to ensure manufacturing control and stability, and to predict their biological fate. Encapsulating drugs within SNEDDSs enhances solubility and stability in the gastrointestinal tract, and absorption, ultimately leading to improved bioavailability. Moreover, the transformation of liquid SNEDDSs into solid dosage forms enhances stability and patient compliance. Innovations in SNEDDS development include the creation of supersaturated, mucus-permeating, and targeted formulations to increase both efficacy and patient compliance. The self-emulsification approach has proven successful in oral drug delivery. This comprehensive review in this book chapter provides insights into SNEDDS for oral administration of lipophilic and hydrophilic compounds, encompassing the journey from experimental bench research to marketed products. Furthermore, this book chapter highlights the application of SNEDDS in the context of central nervous system (CNS) diseases. It explores SNEDDS formulation, mechanism of action, and potential advantages in the treatment of neurological disorders.

Link: <http://dx.doi.org/10.1201/9781032697475-9>





TITLE:

Harnessing metaheuristic algorithms for advanced optimization and design solutions in complex real- world applications

AUTHOR :

R., Kumari, Rashmi; S., Das, Subhranil; K.R., Singh, Kishore Raghwendra; A., Talaan, Arnav; T., Ahmad, Tanzeel; V., Gola, Vishal

JOURNAL NAME:

Nature-inspired Metaheuristic Algorithms (Book Chapter)

DETAILS:

Published on May 2025



ABSTRACT:

For handling any kind of optimization, metaheuristic algorithms have been considered as one of the powerful tools for solving these situations in real-world scenarios. As the optimal solutions are not guaranteed, these algorithms may have demonstrated the versatility and adaptability while obtaining the solutions in various settings in an experimental design. In their strategic approaches, a variety of problems are solved by considering their unique characteristics. The suggestion of problem-based approach is dependent upon the specific type where selecting the appropriate metaheuristic algorithm is guaranteed. Here, the initial sets of solutions are generated by iterative searching mechanism, which happens to be one of the vital components in metaheuristic algorithms. By defining heuristics principle, creations of random numbers are helpful in defining the optimal solutions and improving the accuracy. Fitness value has been computed which is determined by objective function. Exploration and exploitation are two fundamental concepts of the metaheuristic algorithms in finding the optimal solutions. In exploration stage, effective solutions are proposed that prevent the overfitting within the search space. Whereas in the exploitation stage, the optimal solutions are redefined by applying mutation procedure in genetic algorithms. For obtaining the best solution, exploration and exploitation are both needed but it should achieve a good balance. The application of metaheuristic algorithms has been extended to various problems, such as complex non-linear and multi-objective problems. Compared to deterministic algorithms, metaheuristic algorithms are more robust in avoiding local optima. Their applications are diverse, including delivery route optimization, production processes, portfolio optimization, fraud detection, Very Large Scale Integration (VLSI) circuit design, and medical field applications. With a high degree of efficiency and effectiveness, metaheuristic algorithms continue to be valuable tools for researchers.

Link: <http://dx.doi.org/10.1201/9781003612858-3>



TITLE:

Self-Nanoemulsifying Drug Delivery Systems
(SNEDDS) in Lung Cancer

AUTHOR :

A.J., Mali, Ashwin Jagannath; P.D., Velapure,
Pallavi Dasharath; S., Kumbhar, Sakshi; M.,
Kacchi, Muizz; C.D., Bobade, Chandrashekhar
D.

JOURNAL NAME:

Application of Self-Nanoemulsifying Drug
Delivery Systems in Inflammatory Diseases
(Book Chapter)

DETAILS:

Published on May 2025



ABSTRACT:

Lung cancer remains a significant health challenge worldwide, prompting the exploration of novel therapeutic modalities to enhance treatment efficacy and reduce adverse effects. Self-nanoemulsifying drug delivery systems (SNEDDS) have emerged as a promising strategy to overcome the limitations of conventional drug delivery in lung cancer therapy. SNEDDS are lipid-based formulations that spontaneously form nano-sized emulsions in aqueous environments, improving drug solubility and bioavailability. In the context of lung cancer, SNEDDS offer targeted delivery to tumour sites, minimized systemic toxicity, and enhanced drug permeation across biological barriers. This book chapter provides a comprehensive overview of recent advancements in SNEDDS technology for lung cancer treatment. It explores the principles of SNEDDS formulation, emphasizing the role of lipid excipients, surfactants, and co-solvents in optimizing drug delivery kinetics and tissue distribution. Furthermore, the chapter elucidates the mechanisms underlying the enhanced therapeutic efficacy of SNEDDS in lung cancer, including increased cellular uptake and prolonged drug retention. The chapter also addresses future directions and challenges in SNEDDS research for lung cancer therapy, such as personalized medicine approaches and the integration of emerging nanotechnology platforms. Overall, this book chapter underscores the transformative potential of SNEDDS technology in advancing the field of lung cancer treatment and provides valuable insights for its continued development and clinical implementation.

Link: <http://dx.doi.org/10.1201/9781032697475-12>





TITLE:

Innovative Portable Stress Monitoring Unit Using
EMG Application

AUTHOR :

S., Nayak, Seema; S.T., Mantri, Shamla T.; R.K.,
Kanna, R. Kishore; A., Ambikapathy, A.

JOURNAL NAME:

Conference: 2024 1st International Conference
on Sustainability and Technological
Advancements in Engineering Domain
(SUSTAINED)

DETAILS:

Published on 15 July 2025



ABSTRACT:

A common life stage is stress overload, which can have bad reactions even if some behaviors can be executed. Running out of life and personal resources can cause physical, mental, and emotional distress. More than 10 million Americans suffer from stress, and South Asian India pays less attention to mental health compared to Western European countries. According to the World Health Organization, 15 per cent of India's population needs mental health treatment. This suggested study examines how individuals recognize the stress they put on their feet on a regular basis. People who stand a lot and do the same tasks over and over again are susceptible to this kind of stress. This is often caused by varicose veins and calcaneum spurs, which are growths of calcaneum bone. Analyzing the foot stress placed on the rear foot by those with these conditions is the aim of this investigation. In addition to providing physiotherapists with reliable data for arbitrament, this suggested study on stress monitoring may aid users in better understanding stress patterns.

Link:

<https://doi.org/10.1109/SUSTAINED63638.2024.11074086>



Published on August 2025

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